

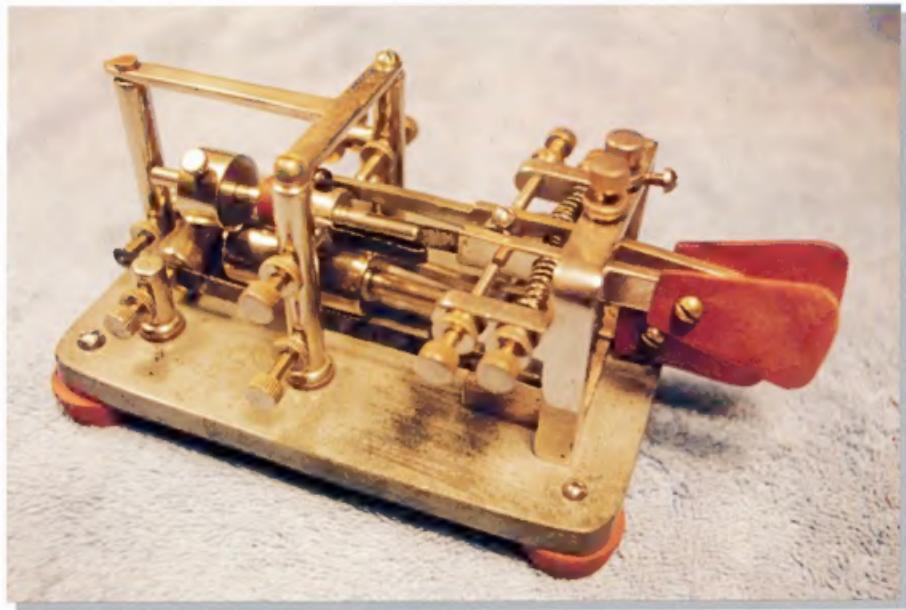
Amateur Radio

July 1997

Volume 65 No 7



Journal of the Wireless Institute of Australia



Full of the latest amateur radio news, information and technical articles including...

- A Baycom Style HF PSK Modem
- Review of Yaesu's FT-8000R Dual Band Transceiver
- The Semi-Elevated Ground Plane - GIRFU Style

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Cover

An M P Thomas Auto Morse Key, made by Hitchcox Brothers, Adelaide. This is one of the keys in the collection of Stephen Smith VK2SPS. Others are shown in the *Pounding Brass* column on page 46.

BACK ISSUES

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PHOTOSTAT COPIES

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The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union

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Editor's Comment

"United" States?

The title does not refer to America, but to our own Commonwealth, which has never claimed to consist of particularly "united" states anyway! However, it seems that the things that divide us are rather less important than the things that unite us. Originally there was even a possibility of New Zealand being part of the Federation, but not only did this not happen, but it was "touch and go" for a while whether Western Australia was going to join.

Nevertheless, Federation arrived on 1 January 1901, and the then six states agreed to hand over some of their responsibilities to the new Federal Government (at that time, the Northern Territory was part of South Australia). Relations between the States have had occasional rough spots since, but have generally displayed friendly rivalry at worst, and sometimes even total agreement.

A few years later, in 1910, the Wireless Institute of New South Wales came into being, with similar organisations in the other States joining in, so that by 1923 there was a Wireless Institute of Australia uniting the six Divisions.

In 1972 a further act of federation brought the now seven Divisions (including that of the Australian Capital Territory) into a joint arrangement for publishing this magazine (previously published for all Divisions by the VK3 Division), collecting membership subscriptions, negotiating with the Government rule-makers, and whatever else seemed better done by a collective body of all Divisions instead of each operating independently.

Over the last few years, it would seem that, as far as some Divisions are concerned, the things which divide us in the WIA have become more important than those which unite us. It would be a tragedy if the baby of unification were to be thrown out with the bath water of dissension!

Bill Rice VK3ABP

Editor

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk or via e-mail are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. A pamphlet, "How to Write for Amateur Radio", is available from VK3BR Communications Pty Ltd on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

WIA Wins Concession on Repeater and Beacon Fees

Licence renewal fees on repeaters and beacons will now cost only \$50 per call sign per site per year. This new arrangement replaces the previous charges, brought in last year, where repeater systems and beacons were charged at the annual rate of \$50 per transmitter frequency, links excluded.

A number of repeater system sponsors closed their repeaters when they could no longer afford the total licence fee, and many others informed the Institute they were considering following suit. In some instances, fees had leapt by a factor of six or seven, from under \$100 to \$500 a year between 1995 and late 1996.

After many months of representations to the Spectrum Management Agency, the WIA-SMA Liaison Team finally convinced the Agency that the charges were inequitable and the Institute was informed of the decision on 27 May.

Applications for new beacons or repeater systems will still attract an

"assignment" fee, which will be charged on an hourly basis, as is Government policy. However, the SMA said that, because the WIA State Divisions do an amount of preliminary work, through the Technical Advisory Committees, this charge will be minimised in line with the essential work which has to be performed by the SMA. The Institute expects to have further details on this in due course.

All SMA Area Offices should have been informed by now.

Where a single transmission site has a number of amateur repeater systems or beacons licensed under several different call signs, the licensee may choose to operate under a single call sign and pay only one licence fee.

The WIA adopted a "single fee per site" policy at its Federal Extraordinary Convention held in February this year (see *WIA News, Amateur Radio*, April issue, page 22).

proposed segment as secondary users. The spectrum from 3700 to 3900 kHz is presently allocated to the fixed and mobile services.

The requested allocation spans the variety of amateur bands allocated by other countries in all three ITU regions around the world. The WIA has suggested access to the allocation be permitted to amateurs holding Unrestricted and Intermediate licenses.

It is suggested the lower 10 kHz of the proposed allocation, from 3750-3760 kHz, be reserved for emergency use, to provide a common allocation with government emergency services which WICEN stations could use during declared emergencies, with 3757 kHz reserved for WICEN nets and exercises. The submission suggests Novices have access to this segment too, but only during emergencies, or to join WICEN nets and exercises.

The WIA submission for a new allocation at 80 m arose after surveys of commercial usage of the band to 3900 kHz. A survey of actual usage, involving listening observations from a number of amateurs at locations around Australia, was conducted over 21 months from January 1993 to September 1994. A questionnaire survey was mailed out in 1995 to all licensees between 3750 kHz and 3900 kHz.

Following the response from the questionnaire survey, to which 53% of licensees responded, a majority of whom did not object to sharing spectrum outside business hours, the WIA made a preliminary submission to the SMA in late 1995.

Subsequent to discussions with the SMA, the WIA presented an updated proposal in mid-1996. The SMA then asked for further particulars to be researched and outlined, especially with regard to possible interference risks, among other issues.

Having researched the requirements set out by the SMA, the submission was completed and delivered to the Canberra office on 23 May. The 5500 word submission, with 11 appendixes of tables, diagrams and maps, was preceded by a one-page, five-point summary.

In discussions with the SMA during May, it was indicated to the Institute that

Submission on New 80m Allocation with SMA

The WIA has finalised and delivered to the SMA the submission for a new amateur allocation of 150 kHz of spectrum above the present 80 metre band.

The Institute seeks a new amateur allocation extending from 3750 kHz to

3900 kHz, on a time-sharing basis, so that amateurs may use the allocation outside standard business hours, on weekday evenings and during weekends.

It is proposed this new allocation replace the existing "80 m DX Window" and that amateurs have access to the

receipt of the submission begins the formal process of considering a new allocation, and that the time frame necessary to consult with users, planning groups within the Agency, the Radio Communications Consultative Council and international regulatory authorities, may be one to two years.

In addition, the SMA indicated that planning guidelines discouraged two high power services from sharing spectrum, and that an option to be considered might be to have separate, exclusive allocations to isolate the services.

Discussions between the WIA and the SMA will continue, so that we can move towards achieving the goal of a new allocation. However, instances of amateurs operating outside the conditions applicable to the present 80 m DX Window, of amateurs interfering with primary service users outside the allocation, as well as using transmitter powers above the legal limit, have continuously been brought to the WIA's attention, hampering discussions with the SMA.

The SMA monitors amateur usage of the 3794-3800 kHz allocation and has issued warning letters, about breaching licence conditions, to operators during the past few years. The WIA seeks the co-operation of all users and potential users of the present 80 m DX Window to stay within the limits imposed by the licence conditions, so as not further to jeopardise continuing negotiations.

The WIA-SMA Liaison Team would like specifically to thank Peter Forbes VK3QI, and those who assisted him, for their preliminary efforts towards the submission, from 1993 through 1995.

SMA Puts Amateur Licence Review On Hold

In separate correspondence to the WIA recently, the Spectrum Management Agency has indicated they have suspended their review of Amateur licences, and the Leader of the Opposition has promised to discuss the WIA's Amateur licensing submission with the ALP caucus.

The SMA's review of Amateur licensing was being carried out as part of a general review by the Agency of non-assigned Apparatus licence types (see WIA News, *Amateur Radio*, June issue, page 4).

The SMA has said that they will take no further action on reviewing Amateur licences until the Department of Communications and the Arts (DoCA) has concluded its review of the 1992 Radiocommunications Act. In its review of the Act, DoCA is considering the WIA's submission on Amateur licensing, given to the Minister, Senator Alston, in February.

In a letter from the Spectrum Management Agency in late May, Alan Jordan of the SMA's Business Directions Group, said: "Following earlier consideration of the licensing arrangements applicable to Maritime and Outpost services, the SMA has carried out a preliminary review of the five personal categories of Amateur Licence taking into account the WIA's recent submission to the Minister for Communications and the Arts entitled 'Towards a New Licensing System.'

"As a result of this review, the Agency has concluded that it is not appropriate or cost effective at this time to consider the majority of matters raised by the WIA until the Department of Communications and the Arts has, in its wider review of the Radiocommunications Act 1992 (the Act), considered the WIA's principal contention that none of the licensing arrangements provided for under the Act

are suitable for licensing Amateur stations.

"In view of this decision, until the outcome of the Department's review of the Act is known, the existing arrangements for the licensing of Amateur stations will remain in place."

WIA Federal President, Neil Penfold VK6NE, said: "This welcome decision by the SMA vindicates the WIA's strategy and timing in presenting our submission to the Minister in February, and the effectiveness of the strong arguments in the submission that our present licensing system does not suit the Amateur Service."

In concluding his letter to the WIA, Mr Jordan indicated that the SMA is considering making changes to the current arrangements regarding the issue of Amateur certificates of proficiency, in the context of work on Amateur examination approvals already under way.

Meanwhile, the Leader of the Opposition in the Federal Parliament, the Hon Kim Beazley (member for Brand in Western Australia), has written to WIA Federal President Neil Penfold regarding the WIA's submission on Amateur licensing.

Mr Beazley said, "I have noted the contents of your submission and can see that it is a complex area which may be due for some degree of an overhaul.

"You would appreciate, in Opposition we are somewhat limited in what we are able to achieve. However, I have forwarded your submission to the Shadow Minister for Communications, Senator the Hon Chris Schacht, and will discuss the matter with him and with other members of the ALP caucus. Thank you for taking the time to write to me about this issue."

The role of the SMA will be assumed this month by the new Australian Communications Authority.



Your Hobby Your Voice

Representing Radio Amateurs Since 1910

ITU Affairs

from David Wardlaw VK3ADW

World Radio Conference Issues to Affect Amateurs

Frequency allocations for Low Earth Orbit (LEO) satellites and satellite-based radars are among the issues on the agenda of the 1997 World Radio Conference (WRC-97), to be held over October-November in Geneva, which will be likely to have an impact on amateur radio frequency allocations and amateur operations in the future.

The International Telecommunications Union (ITU) held a Conference Preparatory Meeting (CPM) for WRC-97 in Geneva in May, producing a 250-plus page book of technical considerations from preparatory groups around the world and concerns of ITU member states over issues to be considered.

According to the *ARRL Letter* of 16 May, issues of special interest to radio amateurs included the possibility of additional frequency allocations to the Mobile Satellite Service operating below 1 GHz - now familiar as "the little LEO issue." No specific frequencies were identified in the CPM report for reallocation. Although the report does address a number of sharing possibilities, it makes no mention of sharing with the Amateur Service.

In addition, a new concept of "broad allocations" for the Mobile Satellite Service was introduced. If adopted, this concept would result in individual nations being able to identify and allocate frequencies from a broad pool of service allocations. This concept, being quite new and unstudied, only resulted in a call for future studies by the ITU. However, it will require close watching from the radio amateur community as it might have the potential of representing a threat to our bands, cautioned the ARRL. However, it is likely that any such studies will be prolonged over a multi-year period.

The work of WRC-97 will be guided by specific proposals submitted by

individual nations. At present, countries have not yet finalised nor submitted their proposals. Until they do, the amateur community will not be able to accurately assess any threats to our bands which may arise for this conference.

Unfortunately, the Little LEOs are not the only new service searching for spectrum. Another is the Earth Exploration Satellite Service's use of synthetic aperture radar (EESS active). This involves a system of satellite-borne sensors designed to collect information about environmental issues and other similar data. A variety of frequencies is being sought, possibly including 430-440 MHz. The amateur and amateur satellite service status in this band is somewhat complex, varying by ITU

Region and even by individual country. So far, studies of sharing possibilities between the Amateur and EESS (active) services have not shown them to be compatible because of the interference level experienced when the two classes of stations are within line of sight.

There is also a type of EESS (active) which would make use of 1215 to 1300 MHz which is of concern to amateurs, affecting the 23 cm band. Studies here show compatibility with some types of services but still represent a potential source of interference to amateur operations.

From May through August, the various member countries of the ITU interested in seeking specific allocations for these services at WRC-97 will be making proposals for the work of the conference. Any possible future threats to amateur allocations and operations will only emerge once these proposals become public.

VK3 Listener Wins April Recruitment Prize

Victorian Division member, M Braun L30952, is the lucky winner of the Fluke 12B digital multimeter, the prize in the April new members' draw in the WIA's 1997 recruitment campaign.

NSW Division members have scooped the pool so far, with new members winning prizes in each month for the first three months of this year.

Each month throughout 1997, a Fluke 12B digital multimeter, worth \$195, is given away to a lucky winner who joined a WIA Division in the previous month. The Fluke multimeter prizes have been generously donated by Philips Test & Measurement.

The Fluke 12B measures AC and DC voltage (with auto-selection above 4.5 V), resistance and capacitance from 1000 pF to 1000 µF. The instrument features a simple rotary dial, a 4000-

count liquid crystal display, and diode and continuity testing. Its "continuity capture" feature indicates intermittent open and short circuits. It comes with test leads and a two-year warranty. Fluke is the world's pre-eminent manufacturer of digital test instruments and the Model 12B is from their recently-released range of hand-held instruments.

Every newcomer to electronics and amateur radio needs a good multimeter, and every seasoned enthusiast could always do with another one!

Membership recruitment advertisements appear in each issue of *Amateur Radio magazine*, and in *Radio and Communications magazine*.

Membership recruitment and renewal advertisements are also on WIA Divisions' World Wide Web pages on the Internet.

Digital

A Baycom Style HF PSK Modem

Alan Cox VK4AOC* describes an interesting GCARS Inc Project.



The HF PSK Modem in its case.

You might ask what is PSK Packet? Well, for a start PSK stands for Phase Shift Keying! PSK has quite a lot going for it, especially when you want to run high speed traffic on a reliable path. 1200 Baud on HF isn't a problem at all. Faster baud rates are quite possible.

Our first introduction to PSK Packet came about when the QDG group (Queensland Digital Group) asked us to consider setting up a PSK Link to VK7 as a message forward station. As the VK4WIG BBS had been set up as a club BBS within our club rooms, it was thought that we would be able to draw upon our resources to make the link a GOING THING.

A sub-committee was formed to investigate the possibility of such a setup. A crystal locked transceiver was provided on a loan basis to the club by Ed VK4JEN for our tests on 14 MHz. A TNC, which was modified for PSK use, was sent down from QDG for our tests. Not knowing a thing about PSK packet, we had quite a lot to learn.

The thing that stood out the most was the fact that not too many others really understood PSK either. We were faced with a steep learning curve, to say the

least. Then along came Doug VK4ZDR. It turns out he had been instrumental in setting up the PSK radio links for NASA during the 60s and 70s and, better yet, he is a member of our club. He is also a co-sysop for our BBS VK4WIG.

Our resources had grown at a great rate in a short time. All we had to do now was put them all together. This is when it all went sour. We did put the set-up together after we were able to find out on what frequency to set the rig. Peter VK4XPD obtained a xtal that would let us work the frequency and tune the rig. The commands for the TNC were finally sorted out and, after a couple of weeks, we finally connected to VK7BBS. We thought we had it made!

However, a few more tests were done and then **disaster!** The TNC died! We didn't have another TNC modified for PSK use. What do we have to do to modify another TNC? Then we came across the G3RUH design for a PSK modem used for satellite communication in conjunction with a TNC. This turned out to be the basic set-up in the TNC we had.

As VK4WIG was running with Baycom style modems at the time, it was considered that there wasn't a great need to persist with a TNC based PSK set-up. Now we had to design a Baycom style PSK modem that would run into an FBB based BBS along with the other modems already in use.

The basic concept for the design revolved around the G3RUH design but utilising the principles as if it was a Baycom modem feeding the computer. The original design simply replaced the TCM3105 chip pins as in a Baycom modem set-up. A PCB was laid out to include the basic G3RUH design for terrestrial use and feed into a Baycom board. Initial tests were done on 2 m

between two local stations, Alan VK4AOC and Ausie VK4TN.

After we sorted out the filter restrictions that the rigs imposed upon us, it worked out quite well. But the next step took a while to finalise. As we had found out quite a while before, the original Baycom modem fed the computer via a 74HC04 chip which meant a pseudo RS232 level was presented to the serial port. This did cause problems with reliable operation, but was resolved by driving our serial port via MAX232 chips which deliver a standard RS232 level.

The next problem to overcome was to provide a stable 1500 Hz TTL level signal to feed the Tx Modulator as described in G3RUH's article. He had suggested that a frequency somewhere between 1400 and 1600 Hz would do the job. Our selection seemed to work out quite well, but it drifted. That problem was solved by the introduction of a low drift capacitor in the circuit. A 10 nF J Polyester with a 120 ppm/degree C was our choice. All our tests on the oscillator have shown a high degree of stability over weeks at a time with a 1 Hz drift.

We also required a time-out circuit to be incorporated with the design and the two spare inverters within the MAX232 were pressed into operation for that. A Tx/Rx LED was also required. The Tx LED wasn't a problem at all but the Rx LED required a bit of thought. It finally turned out to be the "LOCK" indicator LED in G3RUH's set-up.

A prototype PCB was laid out and built. Tests carried out provided instant success with connections to VK7, VK2, VK5 and VK4 stations.

Circuit Description

The circuit can be broken down to five parts consisting of the Tx modulator; the Rx demodulator; the Timeout + PTT circuit; the Rx LED circuit; and the power supply.

Tx Modulator

The data from the computer is fed to a MAX232 gate which inverts and sets an RS232 level in case of long leads. This, in turn, is fed to the 4070 exclusive-OR gate. The output of that gate feeds another 4070 gate which is also fed by our 1500 Hz oscillator. The output of this

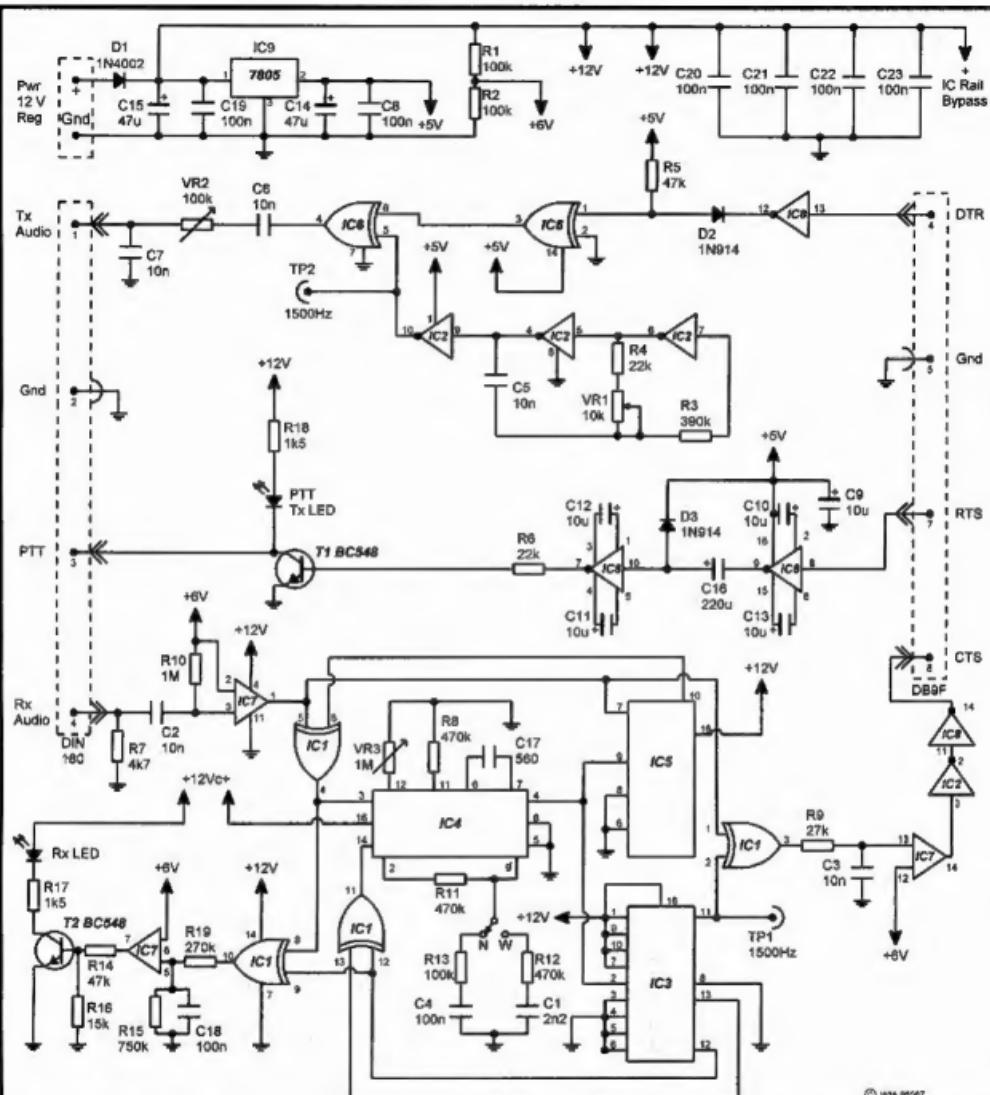


Fig 1 - PSK Modem. IC1 4070, IC2 4049, IC3 40161, IC4 4046, IC5 4015, IC6 4070, IC7 TL084, IC8 MAX232, IC9 7805; T1 & T2 BC548, D1 1N4002, D2 & D3 1N914.

the result of our combination and is coupled to the audio input of the radio. What we have as a result is PSK modulated audio. The level of audio is set with VR2 and the 1500 Hz is set via VR1 and tested on TP2. Please note C5 is

a high stability type, a "J" (120 ppm/degC) C.

Rx Demodulator

Apart from our inclusion of a MAX232 gate, this is part of the circuit

that G3RUH described for his JAS-1 Satellite Modem. It's extremely easy to set-up. All you have to do is adjust VR3 to obtain a 1500 Hz signal on TP1. You can choose two bandwidth settings, 20 Hz and 100 Hz. We have found 100 Hz to



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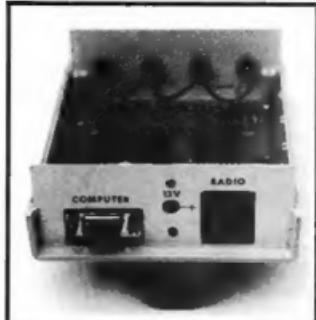
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A rear view of the modem out of its case and balanced on a 50 cent coin.

be the best so far. Please note that C17 should be a polystyrene.

Timeout and PTT Circuit

As we wanted to include a Tx timeout circuit, a decision had to be made as to which chip we could use. Because of the board location, the MAX232 spare gates won the job. C16 and the internal pull-up resistor in the gate set the timeout to approx 22 seconds. A simple NPN transistor is used to switch our PTT line LOW as well as drive a LED as the Tx indicator.

Rx LED Circuit

This part of the project was described in G3RUH's satellite modem, but as a lock indicator. The only thing that has changed is the value of R15 from a 750 k to a 680 k. It gave a better indication of LOCK when using this modem on HF.

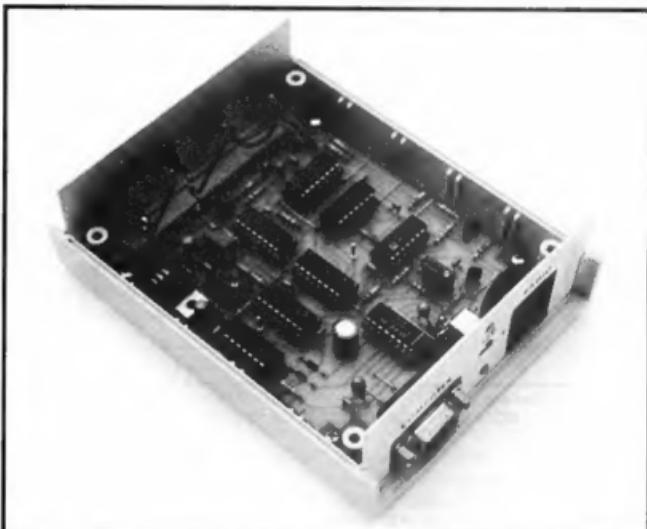
Power Supply

12VDC is used to feed the modem but we did have to provide 5 V DC and 6 V DC as well. A three terminal five volt regulator has been employed along with a simple resistor divider to obtain the six volt line. Total current consumption is well under 100 mA. A well regulated 12 V supply should be used.

Construction

To keep the project as neat as possible, the whole unit has been laid out on a PCB to fit a standard kit size box available at most electronic stores. The only components not mounted on the PCB are the LEDs, power input socket and an ON/OFF switch. We decided to use IC sockets in our first unit but they aren't necessary if you wish to omit them. However, the sockets can save you a few problems if you happen to have done something wrong when loading the board.

Remember to check your voltages



Its professional construction is clearly seen in this view of the inside of the modem.

around the board first before loading the ICs! Double check the IC layout, eg the location of pin one. Make sure you use a high stability capacitor for C5 in the 1500 Hz oscillator. The higher the stability the better. Use multi-turn pots to make the set-up dead easy. Also remember to put the links on to the board FIRST. There is one link required to go under the 40161 which can easily be missed out.

Alignment

You will need access to a frequency counter for the set-up of the modem. First set TP2 to 1500 Hz by adjusting VR1. Next set TPI to 1500 Hz by adjusting VR3. VR2 is set about half way for the Tx audio input and can be adjusted to suit the rig being used. The Rx audio input can be fed straight out of any SSB transceiver extension speaker output. Tune into a PSK station until you see the Rx LED on the modem light up.

You may find that, on some transceivers, the signal has to be fairly strong before you resolve anything at all. It is possible that the audio filters after the product detector are causing the problem. In that case, a simple tap prior to the product detector, with a small amplifier, may be in order. Most commercial rigs used for data do this.

I am using a YAESU FT-102 on 14 MHz at my QTH with a tap from the product detector to an external jack. Austen (Ausc) VK4TN uses a TS-520S with an external speaker jack as his Rx audio source.

Comments

This project has been a challenge to all of us at the Gold Coast Radio Club involved in packet and general RF techniques. One thing that has stood out during the development of the project has been the spirit of amateur radio, and the helpfulness of the members that were interested. I personally would like to give credit to all those who participated in this project.

PC Boards for the HF PSK MODEM are available for \$45. The boards are professionally made and of high quality. Postage is included. All enquiries should be sent to: Gold Coast Amateur Radio Society Inc, PO Box 588, Southport QLD 4215.

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■ Equipment Review

Yaesu FT-8000R Dual Band Mobile Transceiver

Reviewed by Ron Fisher VK3OM*



A front view of the FT-8000R, clearly showing the second row of functions above the remaining seven buttons when the "F/W" button is pushed.

(Photo by Ron VK3OM)

In the March 1997 issue of *Amateur Radio*, I reviewed the rugged Yaesu FT-2500M 2 metre mobile transceiver. This time I will look at the latest dual band mobile transceiver, the FT-8000R. This transceiver covers both the two metre and 70 cm bands with power outputs of 50 watts and 35 watts respectively.

Even with the addition of a considerable amount of electronics, the new dual bander is actually smaller than the current single band model.

The FT-8000R includes an efficient cooling fan attached to the rear heat sink panel. This operates at all times the transceiver is switched on with the fan speed increasing when the transmitter is keyed. The FT-8000R is supplied with a mobile mounting bracket, a hand held microphone and a generous length DC power lead.

The transceiver features a very wide receive coverage from 110 MHz to 550 MHz and from 750 to 1300 MHz, but with the cellular telephone frequencies

blocked out. Reception modes of both AM and FM are included with AM being selected automatically on the aircraft band. The transmitter uses FM and is configured for use on the two amateur bands only. The overall size is 140 mm wide, 40 mm high and 152 mm deep with a weight of just one kg.

The operational features of the FT-8000R include dual receive capability with either the same band or cross band operation. It is also possible to set the

transceiver up as a cross band repeater. There are 108 memory channels with 54 allocated to each of the two amateur bands. Packet operators are well catered for with both 1200 and 9600 bps operation available. A rear panel jack has been provided to allow easy interface for a packet modem.

A new feature that Yaesu call "The Smart Search" automatically sweeps the band and loads active frequencies into dedicated memory banks. Yaesu claim that this feature can identify active repeater and simplex frequencies when you visit a new location. Of course, the frequencies have to be active for the feature to work.

The FT-8000R has a built in diplexer so there is only one antenna connector. There are advantages and disadvantages in this. It, of course, makes it easy for direct feed of a dual band antenna but, if you prefer a separate antenna for each band, you will need an external diplexer. The antenna connector is an SO-239 which just might raise a few eyebrows among dedicated 70 cm operators.

FT-8000R On The Air

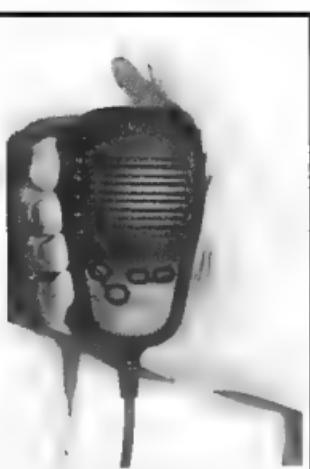
The FT-8000R is very easy to get on the air and this is certainly helped with the superb "Omni-Glow" LC display which gives all the information needed. Designations for the eight buttons under the display are shown on the display. When the "F/W" button is pushed, the remaining seven buttons have second functions which are displayed above the original designations. All very neat and you just cannot go wrong.

On initial switch-on for a couple of seconds, or at any time later by pushing and holding down the audio gain control on either side of the transceiver, the



The FT-8000R indicating power supply voltage (see text).

(Photo by Ron VK3OM)



The MH-42B6J hand held microphone supplied with the FT-8000R. (Photo by Ron VK3OM)

battery voltage is shown on the display (see photo). This is very handy to keep a check on the state of your car battery, or the power supply if you are using the transceiver at home.

Tuning the FT-8000R has been very well thought out. Let's go through the options. Firstly, the tuning steps via the main tuning control can be set to 5, 10, 12.5, 15, 20, 25 or 50 kHz segments. I usually chose 25 kHz steps as this fits in with the Australian band plan. If you want to tune through the general coverage receiver segments you can select either 10 MHz or 1 MHz steps to get to the frequency you want quickly.

The microphone supplied with the FT-8000R is the MH-42B6J. This has up/down buttons on the top and four small buttons on the lower front. Only one of these has any function on the FT-8000R. This is the "P" button, which allows VHF/UHF band changing from the microphone. One thing that I am not sure about is the modular connector for the microphone. The plastic plug is actually moulded on to the microphone cable so fitting a new one, if trouble occurs, would be virtually impossible. I guess time will tell just how reliable these connectors are.

However, the transmit audio quality was rated as excellent. Yaesu seem to

have solved the earlier problem of spitty speech. Even without asking, several stations commented on the almost broadcast quality of the transmitted signal. I wonder how it would sound with a MD-100 desk microphone connected.

A wonderful feature is the "time-out timer". Everyone should have one of these (and use it). This can be set in one minute intervals from one minute to sixty minutes (some repeater!), and the transceiver will return to receive mode after the pre-set time is exceeded, which saves the embarrassment of timing out the repeater.

FT-8000R on Test

The first test was for power output and current drain. My test showed that the specified power output was spot on. The transceiver produced 50 watts on two metres with 13.8 volts to the power cord (13.7 volts on the transceiver display) with a current drain of 10 amps. At 70 cm power output was measured at 37 watts and current drain at 8.5 amps.

I then reduced the voltage to simulate a rather sick car battery. At 11 volts the transceiver was still producing a healthy 30 watts output on two metres and, with the voltage down to 9.5 volts, the output was an amazing 15 watts. Below this the transceiver stopped transmitting and receiving. However, you will still be able to call for help long after the battery has stopped cranking the engine.

Power output is selectable at two lower levels if required. These are ten and five watts respectively and are the same for both bands. My tests showed these to be as specified.

The next important feature for a mobile transceiver is the audio output capability, both electrical and acoustic. The in-built speaker is built into the top of the cabinet. It is small, about 4 cm in diameter and has very limited power handling capability and low frequency response. In other words, an external speaker is a very desirable extra.

In fact there are two external speaker output sockets so that it is possible to feed a separate speaker from each of the two receivers. A mix of both sides is available on one socket. Measured power output across a four ohm load was 3.4 watts at maximum output with 14% distortion; at two watts output distortion

had dropped to 3.4%. The specification states 5% at two watts. These figures are very satisfactory and feeding a good external speaker you will make a lot of noise.

Talking of noise, the measured audio signal to noise ratio relative to full power output was -45 dB, a very reasonable figure. Receiver sensitivity is specified for both amateur bands for both the main and the sub receiver. There is no specification for out-of-band receiver performance so I decided to check sensitivity on the amateur bands and at 120 MHz in the aircraft band (which is probably the one I would use the most).

The radio switches to AM mode on the air band and sensitivity measured 10 dB S/N at 1 μ V input. Sensitivity on the amateur bands for 12 dB SINAD is specified at 0.18 μ V for the main receiver and 0.25 μ V for the sub receiver. My measurements confirmed these figures with a generous margin.

In summary, the technical performance of the FT-8000R is first class and should please the most critical operator.

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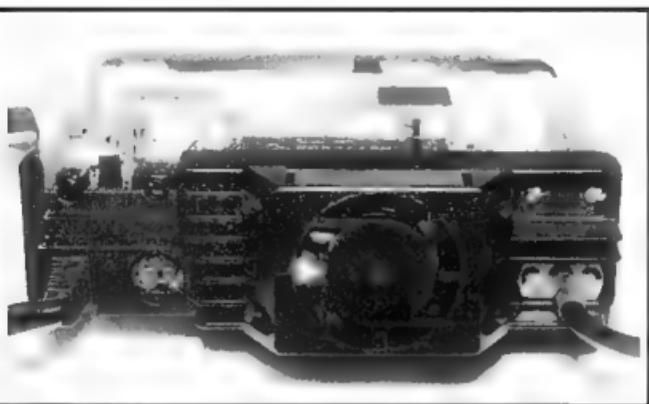
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A rear view of the FT-8000R with the covers removed. Note the large but quiet cooling fan.

(Photo by Ron VK3OM)

FT-8000R Instruction Book.

Yaesu seem to be setting the standard in excellent instruction books these days. First and foremost, you actually get a circuit diagram! Another thing that I find most useful is the "Quick Code Sheet"

which lists all of the hidden functions and tells how to access them quickly. Keep a copy in your glove box.

The instruction book runs to 64 pages and is very easy to follow. Top marks to Yaesu!

FT-8000R - The Bottom Line

At a new selling price of \$799 this transceiver is absolutely excellent value and, of course, Dick Smith offer a full two year warranty. With its Mil-spec approval this transceiver is designed for hard work so the chance of needing the warranty is fairly remote. Our transceiver was supplied to us by Dick Smith Electronics and you should contact them for any further details.

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■ Antennas

The Semi-Elevated Ground Plane - GIRFU Style

W A McLeod VK3ML* brings us yet another fascinating article on antennas.

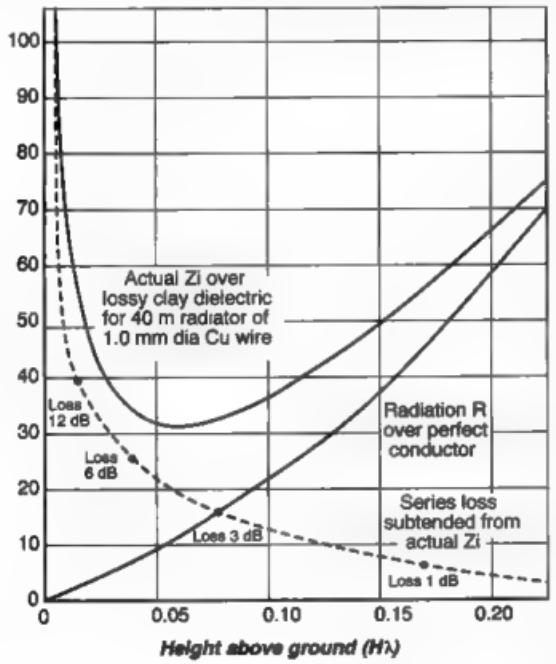


Fig 1 - Radiation resistance of a half-wave dipole less than a quarter-wavelength above ground.

Over the 100 years since Sir Henry Jackson experimented with vertical monopole radiators on Navy ships and Marconi, and then adapted the system for land use, there has been controversy as to the optimum type of counterpoise to use. For HF use, direct connection to earth, an extensive under surface ground mat,

an on-surface ground mat or tuned counterpoise, and an elevated tuned counterpoise have all been advocated. Recently the latter has been the popular choice and, compared to the losses to be expected in a surface dipole (see Fig 1), this choice is justified. Of course, as a counterpoise, the twin quarter

wavelength sections are driven in equiphase parallel, rather than in series as for the dipole, but the capacitive coupling to ground still exists. The major effect of this is over the end 37% of each section, and this is the high voltage portion which must be elevated, while the remainder is less critical. Compare the effects of the "saggy" dipole with the "droopy" version at Table 1.

Then there is the multi-wire system of Admiralty handbook Vol 2, 1938 at Section "R" p 26 which "shows wires running radially outwards on insulated supports, without connection being made to earth plates at the outer ends of the system"; and "it should extend on all sides by a distance equal to the height of the aerial."

These observations are born out by computer simulation of similar systems by VK1BRH (*Amateur Radio*, October 1995) but the minimal practical requirement is for a two-dimensional system, even though with some slight loss compared with the three legged type of counterpoise. Even in wet weather most of the dielectric is air, giving a much more stable system than a direct ground, or a surface counterpoise which changes from a water dielectric ($K = 80$) when flooded to dry clay ($K = 4$ to 8) in dry weather!

These changes can affect the apparent length of the monopole by as much as 5% to a "direct" earth, and that of a surface counterpoise by a much greater amount. This necessitates the use of a variable tuner with modern transmitters and uncertain radiating efficiency generally.

It is probably these uncertainties which result in vague statements about "one quarter wavelength" for element lengths, but very little information is available for setting up a system. Actually, an electrical quarter wave surface counterpoise can be approximately 50% of the free space length and vary 10% from wet to dry conditions on a "common clay" surface. On a desert sand dune the same quarter wave can be expected to be 90% or so, and, of course, the wet conditions rarely occur!

To avoid these variations, a semi-elevated type counterpoise for a monopole radiator was selected for test at

Horizontal dipole - 8.940 m + 8.940 m - nominal 33 uH								
	Shape	Height (metres) End - Centre - End	Freq kHz	Impedance Ω	"E" factor %	Measured C = pF		
Level	—○—○—	2 2 2	7765	31.5	92.50	38		
Saggy	—○—○—	2 1 2	7810	■■■	93.00	37		
Level	—○—○—	1 1 1	7705	35.5	91.75	39		
Droopy	—○—○—	0.05 1 0.05	6977	47.0	83.00	43		
Level	—○—○—	0.05 0.05 0.05	4710	116.0	56.00	110		

© VLA 9000P_T1

Table 1 - Effects of shape, close to clay ground for dipole of 1 mm diameter PVC covered wire (hot, dry weather - green grass).

10.125 MHz (Fig 2). With the high voltage ends of the quarter wave sections above ground by 1/30 wavelength (1 m) the ground loss should be reasonable, far less than the 8 dB for the dipole at Fig 1. This counterpoise can be physically accommodated some 150 mm offset from a non-metal fence with about one-third of each leg enclosed in the 12 mm polypropylene tubing used for watering systems as safety double insulation.

Available information on practical realisation of the system is minimal so the following get-it-right-first-up (GIRFU) method was adopted to have the unbalanced system resonant in both dimensions:-

1. Set up the system with three nominal quarter wave sections of 300/F MHz divided by 4, using 2 mm insulated wire (7 x 0.66 mm electricians earth wire).

- With the vertical section disconnected, check the resonant frequency of the two counterpoise sections connected in series as a balanced low dipole. Probably some 5% to 10% too low, so this number of centimetres for every metre of their length must be removed from BOTH legs. If in doubt, start with only 2/3 of this and test again before removing the remainder.
- With the vertical section connected to each separate horizontal leg in turn, check the resonant frequency (not necessarily the design frequency) for a balance between the two. This vertical quadrant is quite an efficient radiator in its own right, but emits a horizontally polarised component which can be cancelled with the other leg of the counterpoise connected. If the two differ by more than 0.5%,

check for metal posts, standpipes, etc within two metres of one end or shallow water pipes under a leg. Resisting may be necessary to avoid these unbalances.

- With the counterpoise legs balanced, tune the vertical radiator against either leg. That is, check resonance, which is probably too low by 3%, so remove that number of centimetres for each metre of length from the vertical radiator.
- Connect both horizontal legs in parallel as a balanced counterpoise and check resonance against the vertical radiator. Now, it will be probably 1% too low with the additional capacitance to ground of the second leg. Once again, remove this amount in cm per metre from BOTH counterpoise legs and recheck the final result.
- Measure the RF impedance of the system and connect a static bleed resistor of at least ten times this value between the counterpoise centre and an earth pin driven to at least 50 cm depth. For a 38 ohm impedance, a 10 watt wire wound resistor of 390 ohms, encapsulated in "Araldite", should be robust enough. A direct earth can increase loss and unbalance the system; isolation is essential.
- For use with RF power less than 100 W, an additional static bleed non-inductive resistor of 10 kilohms at a 2 W rating is also recommended across the feed point to dissipate static build-up and absorb induced surges from lightning in the environs. For higher power a 240 volt appliance lamp rated for 10 W would be more appropriate.
- Bury the co-axial feed cable run at right angle to the counterpoise for at least a similar length so that any outer screen current has negligible effect on the system.
- Enclose the outer high voltage portion of each counterpoise leg in the 12 mm polypropylene tubing used for garden watering systems, even though the wire is insulated, as double insulation to prevent human contact. And, of course, it protects the possums as well!

The result is a vertical radiating system for DX with about 6 dB margin over a horizontal dipole at 4 m high for

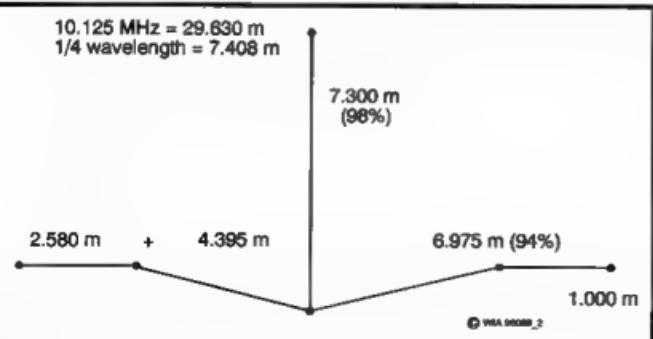
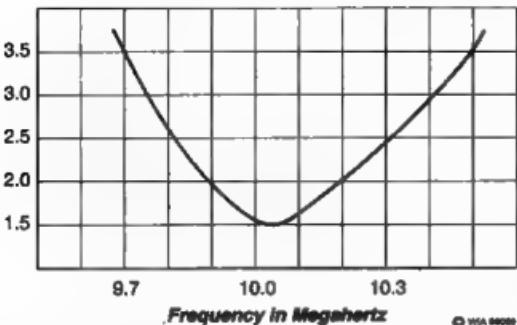


Fig 2 - 30 m vertical with two radials displaced by 1/30 λ above damp clay ground.

VSWR



Frequency in Megahertz

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Fig 3 - SWR of 30 m vertical with two radials displaced by $1/30 \lambda$ above damp clay ground.

distances beyond 600 km. Of course, for shorter distances (less than 300 km), the low dipole has a similar margin by near vertical incidence skywave reflection.

As the dielectric from the counterpoise ends to ground is mostly air, even in heavy rain, the tuning does not alter appreciably from flood to drought as with a surface counterpoise or direct earth connection.

This stable tuned radiating system, with an input impedance of about 38 ohms will have a VSWR less than 1.5:1 to a 50 ohm transmission line with a bandwidth of 350 kHz at the 2:1 limits similar to the low horizontal dipole at 4 m high, so a similar efficiency can be expected.

The tuning system has been based on

VSWR as being more definite and suited to amateur practice. For those who wish to use resistive methods, the resonance point will occur about 150 kHz higher in frequency.

The get-it-right-first-up procedure should produce a satisfactory result when scaled for the other HF bands in locations where the configuration can be accommodated but, for 80 metres, the dimensions can become excessive. However the whole system does not need to be elevated, only the outer ends.

For further reading, the author's article *Low Radiators and High Ground Planes in Amateur Radio*, November 1994 is suggested.

42 Capon Street, Chadstone VIC 3148

WIA News

Under 21s Get Free Licences In UK

In a move to encourage more young people into amateur radio, British amateurs under 21 years of age get their licences free from 1 July. The UK regulatory authority, the Radiocommunications Agency (RA), made the announcement in May after consultation with the Radio Society of Great Britain (RSGB).

Previously, only British Novice

licence holders got their licence free if they were under 21 at the time of application or renewal. According to the RSGB's *GB2RS News* of 25 May, new applications registered on, or after, 1 July will be issued free of charge while existing licence holders under 21 years of age will not be charged a fee providing their licence expiry date is on, or after, that day.



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■ Packet

10 MHz Modification for Flash PAD207 TNC

Ron Graham VK4BRG* supplies some notes on upgrading performance of a popular kit TNC.



Fig 1 - Full size PCB layout (copper side).

Details of this TNC were described in an article by Colin MacKinnon VK2DYM, which appeared on page 14 of the March 1993 issue of *Amateur Radio* magazine.

This modification is easily reversible. After doing the 5 MHz modification as described in the original documents, the only on-board soldering is to change the crystal. The modification may be performed in stages and operation of the TNC verified at the conclusion of each stage.

The "serial bit rate" jumpers remain as per the original, with the exception being that the 38,400 rate will not be available. As a bonus, due to two chips being replaced with their CMOS equivalent, current consumption will be reduced from 400 to 200 mA approximately.

Recent TNC kits have been supplied with a 6 MHz CPU and SIO/0 Chip and a 150 nanosecond (ns) EPROM.

At this stage check your existing 27C256 EPROM. A 150 (ns) or faster device is required. This is normally indicated by a "-15" (for 150 ns) or "-12" (for 120 ns) appearing after the type number, eg 27C256-15. Should your TNC be fitted with a slower EPROM, you will have to transfer the contents to

the new faster device. You may need to seek out a friend with an EPROM programmer!

Technical Details

It is easy to double the processor, or system, clock speed by simply changing the crystal and ensuring that the associated chips are capable of operation at the new speed. However, the original clock speeds must be maintained for other "essential" functions. These are the SIO (A) and (B) clocks, the TIC timer and, if the AM7910 modem is still used, its clock. This may be achieved by an extra division by two for those clock frequencies involved. In other words, as we have doubled the system clock frequency, we must halve the resultant

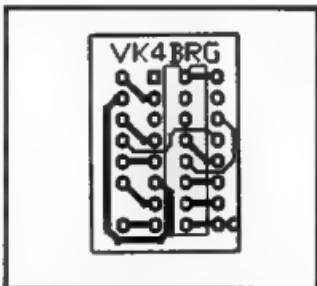


Fig 2 - View of the top of the PC board (150% of actual size) showing tracks and the 4020 IC on top of the board. Pins, protruding downwards, are initially soldered into the two rows of pads unoccupied by the 4020. These pins mate with the IC socket from which the 4040 IC on the TNC is removed. The pad on the bottom right hand side is for the flying lead to supply the clock signal to the on board 7910 modem, if required (see text for details).

new "other essential" clock frequencies before they may be utilised.

This is achieved by substituting a 74HC4020 divider in lieu of the original 74HC4040 and rearranging the connections. The new connection arrangement may be achieved in a suitable unit which is plugged into the 74HC4040 socket.

Thus, the whole modification is reversible by removing this "plug in" unit and refitting the 74HC4040. This makes quite a neat arrangement, apart from the modem (AM7910) clock.

As my reasons for this 10 MHz modification were to utilise the TNC for higher speed modem applications (wired via the optional 16 pin modem connector) the existing modem clock is not required. However, it is possible to connect the in-built modem's clock with a flying lead from the above mentioned "plug in" unit to the socket pin 6 of U9 (74HC107). The IC is removed from its socket, pin 9 of the IC is bent out by ninety degrees, the flying lead inserted into that socket hole, and the IC reinserted into the socket.

This connects a 2.45 MHz clock signal from pin 9 of the "plug in" 4020 unit to socket pin 6 of U9. That is a convenient input point for the modem clock.

By enabling the in-built modem as described above, one is able to verify the operation of the whole TNC at 10 MHz at, say, 1200 baud on VHF. This is a logical step prior to fitting a higher speed modem. Once that is in operation, the flying lead could be removed.

Parts Required

- a)* 3 pin header and shorting link-to perform 5 MHz mod as per original documentation.
- b)* 27C256-15 EPROM (see above).
- c)* Z84C0010 10 MHz CMOS CPU.
- d)* Z84C4010 10 MHz CMOS SIO/0
- e)* 9.8304 crystal, HC6U type
- f)* 74HC4020 IC
- g)* 16 pin IC socket, or
 - + 74HC4020 modification kit (includes items f. and g. - details follow).

Available from:

- * Farnell Electronic Components, 72 Fernell St., Chester Hill NSW 2162. 02 9644 8888.

R & D Electronics, 4 Plane Tree Ave,
Dingley VIC 3172. 03 9558 0444.
+ see author, VK4BRG@VK4BRG, or
PO Box 323, Sarina QLD 4737.

5 MHz Modification

Locate the L2 link (centre of board) and cut the track on the bottom of the board between pins 2 and 3 (pin 1 is towards rear of board). Install a 3 pin header in L2 and put a shorting link between pins 1 and 2. Confirm that your board is fitted with a 6 MHz CPU and SIO chip (otherwise you will have to install the new 10 MHz devices at this time). You should be now able to verify that the TNC is working at 5 MHz.

Fitting 10 MHz Chips

Unless you were obliged to fit the fast chips for the 5 MHz test, now carefully remove the slow Z80 CPU, SIO and, if necessary, the EPROM. With the new chips correctly orientated, and taking care that all pins enter the socket correctly, insert these chips. Once again verify that the TNC is working.

74HC4020 Divider Assembly

There are three options available. The resulting units plug into the IC socket

originally occupied by the 74HC4040 divider. For options 2 and 3 I have designed a small circuit board which performs the interconnections between the new 4020 and the original 4040 divider.

Options:

1. Make up the 4020 IC and 16 pin socket assembly. This does not use the circuit board. The 4020 is piggy backed onto the 16 pin socket with some pins inserted directly into the socket. The remainder are bent out and hard wired to the required socket pin.

Advantages - cheap and uses commonly available parts.

Disadvantages - very fiddly, possibility of errors, assembly not very rugged.

2. Make up assembly using the circuit board. Pins are removed from a 16 pin DIL component header and soldered to the board to form the plug. The 4020 may be soldered directly to the board. Alternatively, a 16 pin IC socket is soldered to the board and the 4020 fitted to that socket.

Advantages - less chance of errors, more rugged assembly.

Disadvantages - necessity of obtaining board, must obtain a type of

component header with long pins, must align pins after soldering to board.

3. Obtain the assembly already built. If there is the demand I am prepared to build up the assemblies at a reasonable cost.

Update

There have been rumours that this TNC kit would soon be no longer available. I contacted the suppliers, World Wide Electronic Components in Perth early in May 1997 and was informed that there are still 25 kits in stock. He mentioned that a potential problem for the future would be supply of the AM7910 modem chip which is no longer being manufactured.

I have found these units provide the most economical stand-alone TNC, or building block to which other modems may be added via the optional internal modem disconnect socket.

I have developed and have PCB designs for:

a. A plug-in 1200 baud (TCM-3105 based) modem (to do away with the power hungry 7910) which is handy for solar powered sites (note, however, the TCM-3105 is also discontinued!); and

b. A 1200 baud PSK modem which interfaces to, and derives power and clock signals from, the TNC via ribbon cable to the modem disconnect socket.

*PO Box 323, Sarina QLD 4737.

Connections

New 4020	Old 4040	Function	Frequency
1	n/c		
2	1	TIC timer	600 Hz
3	n/c		
4	3	4800 baud	76,800 Hz
5	5	9600 baud	153,600 Hz
6	2	2400 baud	38,400 Hz
7	6	19,200 baud	307,200 Hz
8	8	ground	
9	9	modem clock	2.45 MHz
10	10	clock in	4.90 MHz
11	11	reset	
12	13	600 baud	9,600 Hz
13	4	1200 baud	19,200 Hz
14	12	300 baud	4,800 Hz
15	n/c		
16	16	+5V	

Notes

1. Jumper positions L3 and L4 for both terminal and modem remain as original.
2. 38,400 baud position is not available.
3. Pin 9 connects to the "flying lead" which in turn connects to socket pin 6 of U9 to supply the modem clock to the in-built modem.

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of May 1997.

L21037	MR D DOUGLASS
L50612	MR R BAX
VK2BFN	MR A A CLOUT
VK2BSR	MR O LOPEZ
VK2ERQ	MR F H GLEASON
VK2HBV	MR A W MADDEN
VK2KQ	MR J PAYLING
VK5AIC	MR I R CLAYTON
VK6BHY	MR M L TUTT
VK7HDM	MR D J MOSS

■ Technical

Technical Abstracts

Gil Sones VK3AUI*

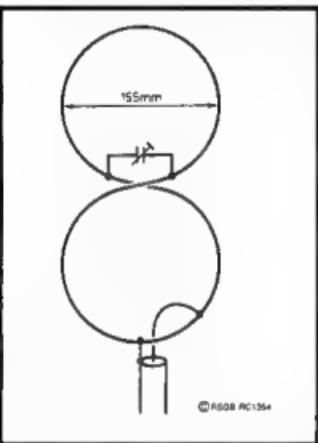


Fig 1 - PA0FRI magnetic 8 antenna.

Magnetic Eight

A n interesting double loop antenna was described in *Electron*, January 1997, by Frits Geerligs PA0FRI, and translated and reprinted in *RadCom*, May 1997, by Erwin David G4LQI in his *Eurotek* column. Frits PA0FRI has had a number of designs published.

The antenna consists of two loops, one above the other, hence the magnetic eight title. The loops both have a circumference of close to a quarter wave and are

connected in parallel with a capacitor at the crossover tuning them to resonance and serving to separate them at the crossover point. They are shown in Fig 1. The frequency is 145 MHz for the two metre band and is at band centre for Europe.

Matching arrangements are shown in Fig 2. Frits tried both a coupling loop as shown at Fig 2a, and a gamma match as at Fig 2b, and finally settled on a combination as shown at Fig 2c. He calls this a combi-match as it has elements of both the loop and the gamma match.

The loops were made from a one metre length of 3 mm diameter brass welding or brazing rod. A suitable pipe or can makes a good bending aid. The ends were joined by soldering into a sleeve at the bottom. The capacitor was a 10 pF ceramic piston trimmer. Attachment of the trimmer is shown in Fig 3. This is suitable up to 10 watts. Similar trimmers are available from time to time at hamfests. For outdoor use some sort of enclosure will be needed for the trimmer.

The trimmer must be adjusted with a non metallic tool. The trimmer is resonated and the match adjusted to give best SWR. Some interaction between adjustments is to be expected. A 2:1 SWR bandwidth of 1 MHz was obtained. Polarisation is vertical with a figure 8 radiation pattern. The pattern

and the narrow bandwidth may be of use to reduce signals from other services.

Audible Meter Reader

In *QST*, March 1997, Anthony McCloskey WA3CAO described an audible meter reader. This is an aid which allows a meter reading to be converted into an audio tone. An adjustable reference tone is provided so that the reading can be determined by comparison between the two tones.

The circuit of the device is given in Fig 4. The loudspeaker used is a small eight ohm type. The oscillator IC U2 is a 74LS629 dual voltage controlled oscillator IC. This IC is available from at least one local source of components.

The reference oscillator is adjusted to zero beat with the oscillator driven by the amplifier U1. The position of the reference pitch potentiometer then corresponds to the input voltage. The gain of U1 is set by pre-set R2 so that the maximum audio frequency corresponds with the meter full scale reading. The gain of U1 can be varied over a considerable range so that a variety of meter sources can be accommodated.

The unit is battery powered and should be housed in a plastic case so that the unit is independent of earth. This allows the unit to be used in a variety of situations at modest potentials above equipment earth. However, it should not be used in a situation where it has to float at a dangerous voltage. Specialised construction techniques and components would be needed for such service. The insulation afforded by a plastic box should, however, allow use in low voltage circuits (operating up to 12 volts) without problems.

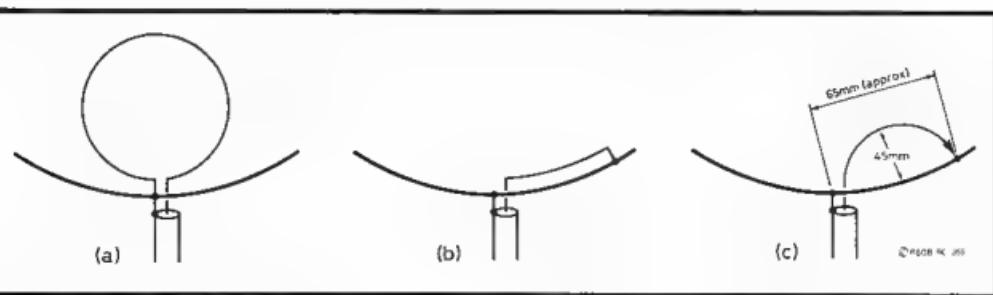


Fig 2 - Matching the magnetic 8.

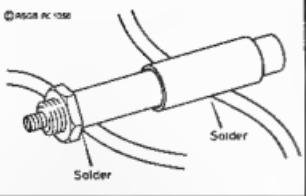


Fig 3 - Piston trimmer tuning capacitor mounting.

Fuses

Interesting information concerning fuses is contained in the *In Practice* column of Ian White G3SEK in the February 1997 edition of *RadCom*. The use of fuses to protect equipment and wiring is common, but how they actually work is often not well understood.

Fuses can blow slowly under a

moderate overload or they can blow quickly under an extreme overload. They behave differently in these two cases. At the rated current of a fuse it will not blow and considerably more than the rated current is required before it will blow even after some time has elapsed.

A moderate overload results in heating of the fuse wire. The wire heats up until it is hot enough to melt and break the circuit. This may take some time for a moderate overload less than twice the rated current. In Fig 5 the typical time to blow is shown for a range of multiples of the rated current. Below twice the rated current the fuse could well last long enough for other devices to be barbecued. Most wiring has sufficient reserve to survive. Semiconductors may not have such reserves.

Overloads greater than five times the rated current will result in the fuse

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Fig 4 - Audible meter reader.

WIA News

European Amateur Licences Upgraded

Amateurs in Finland and Poland have won more privileges in recent changes to their licence regulations and privileges.

The National Radiocommunications Agency of Poland has created two new types of Amateur Radio license, known as Class 3 and Class 4. Class 3 includes a 5 wpm Morse code test and authorises operation on 3.550-3.750, 28.050-28.500, 144-146, and 430-440 MHz. Class 4 has no Morse code examination and authorises operation only on 144-146 MHz. Morse code and voice operation is permitted using an output power of no more than 15 W. IARU band plans are to be observed. The minimum age is 12 years. Call signs begin with the prefix **SQ**, followed by the usual call-area numerical and a three-letter suffix.

Finnish amateurs have been granted more bands and higher power. The new privileges include:

(1) 135.7-137.8 kHz is available to all holders of general or technical (CEPT 1 or CEPT 2) licenses, with an output power limit of 100 W;

(2) 3400-3408 MHz is available to holders of general or technical licenses;

(3) The 160 metre band is expanded to 1810-1855, 1861-1906, and 1912-2000 kHz;

(4) Output power is increased to 1 kW on HF and 150 W CW or 600 W PEP on VHF;

(5) Telecommunications class ("VHF Novice Class") licensees have gained 144-MHz privileges plus all microwave bands allocated to the Amateur Service on a primary basis;

(6) The numeral in a Finnish call sign will no longer be tied to the station's location, except for the Aland Islands (OHO) - the SRAL encourages amateurs to continue the use of district numbers to indicate their location;

(7) Any available call sign may be requested, for a one-time fee of 2000 FIM (approximately A\$515!);

(8) Keeping a log book is no longer mandatory;

(9) Third-party traffic rules have been eased.

(Thanks to the **ARRL Letter**, 6 June 1997).

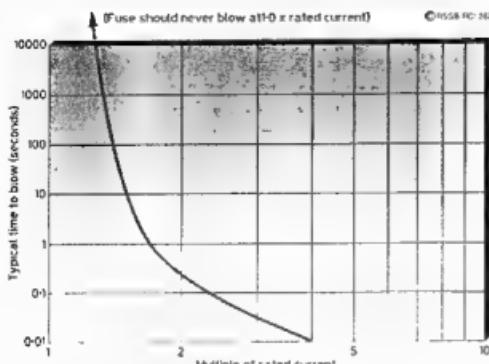


Fig 5 – Typical time for fuse to blow.

blowing quite rapidly. Normal fast acting fuses would blow within one AC cycle at 50 Hz or within 20 milliseconds for a five times overload.

When greater overloads occur the current possible is often far greater than that required to blow the fuse. In a high voltage or AC mains circuit an arc can develop as the fuse opens and the time taken to extinguish the arc can be significant. During the time that the arc exists, current continues to flow. This is shown in Fig 6. The time taken for the fuse action is extended. This could allow enough current to flow for long enough to rupture another fuse in the circuit. Thus, not only the fuse in the equipment could blow but also the fuse in the house switchboard might blow. Even more

embarrassing could be the supply authority fuse.

Some fuses are packed with powder to assist in extinguishing the arc, or incorporate other arc-snuffing features. This is particularly important for high voltage circuit fuses such as in a linear plate supply. Normal fuses are usually only rated to interrupt 240 volt AC mains.

"Slow Blow" fuses have modifications so that they take longer to heat up and so resist moderate overloads. They have a longer thermal time constant. They will, however, respond quickly to gross overloads. They are of use to cope with short duration moderate overloads.

Fuse manufacturers provide an indication of the performance of a fuse in the $I^2 t$ rating. This is the rupture current squared multiplied by the rupture time. The rupture time is made up of two parts as shown in Fig 6. The first part, or pre-arc time, is independent of the supply voltage but the arcing time is dependent on the supply voltage. The arcing time is also different for AC and DC circuits as the AC assists in extinguishing an arc as it reduces to zero before reversing polarity during the course of an AC cycle. The use of this rating allows other components, such as semiconductors, to be rated so as to survive the blowing of a fuse. Most large power semiconductors also have an $I^2 t$ rating.

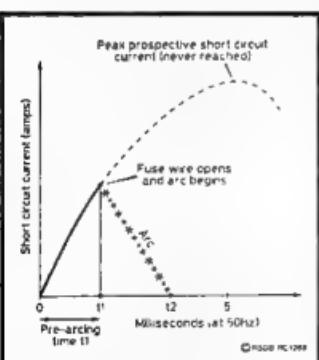


Fig 6 – Fuse blowing time showing rupture and arcing time.

*C/o PO Box 2175, Caulfield Junction VIC 3161

■ Antennas

Random Radiators

with Ron Cook VK3AFW and Ron Fisher VK3OM*

This month's column is mainly for the HF antenna experimenter and gives general information on two interesting verticals and a compact antenna.

Portable Antenna for Outback Operation on 160 m

Rob VK8RC has made a number of coast to coast return crossings of the continent in his trusty Holden station-wagon. His most recent trip (May 1997) was along tracks that took him through Alice Springs. On this trip he has been operating mobile on 30 m during daylight hours and on 160 m during the evening and early morning. He maintained contact with stations in VK1, VK2, VK3, VK4, VK7, and VK8 throughout the trip. Quite probably he also worked the other States, but this wasn't during the few days I listened in. How do you maintain contact over 2,000 km when operating portable with 100 W? You need a very good antenna!

Here are the details of the antenna as described to me by Eric VK3AX. It is a vertical made of metal tubes. The bottom section is just over 9 m (30 feet) high. A plastic laundry bucket serves as a former for the loading coil. The coil is 20 turns of 7/0.36 copper wire. The taper locks the turns in place. The top section is 3.3 m (10 feet) long and insulated from the bottom section. Large washers locate the inverted bucket.

Guy wires are attached about 2.3 m (7 feet) up the top section. The first 5 m (15 feet) are wires which provide some top loading. The remainder of the guys are nylon fishing line.

The base of the vertical sits on a wooden block. An insulating clamp holds the bottom section firmly to the wagon. Additional stabilising guys run from the 1.7 m (5 feet) level to the wagon.

Four radials, one quarter wavelength long, complete the antenna. A tuner ensures a 50 ohm load for the transceiver.

The efficiency of the antenna comes from the significant size of the vertical and the combination of inductive and capacitive loading. The dry desert soil may also assist the operation of the radials as these work best when above the effective ground.

Improved Wide-band Antenna

Long time readers of *Amateur Radio* will recall references to wide-band dipoles and monopoles. The original concept should probably be credited to Altshuler, with improvements by Wu and King, all being well-known American investigators of antenna design. Two Australians, Guertler and Treharne also made significant contributions. There are several methods of broad banding an antenna.

One is to make the monopole or dipole element into a cone or fan. Another is to add reactive components to make a dedicated built-in ATU, although this

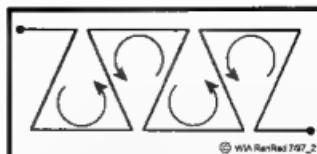


Fig 2 - Folding an antenna in this form cancels some of its natural inductance.

gives a lower efficiency than the first method. The third method is to terminate the antenna elements in a resistance equal to the characteristic impedance of the element.

The Terminated Rhombic is a well-known example of the third method. For single wires the terminating resistor is connected to the ground. If the element is not close to the ground, as is the case for most VHF antennas, this is not practical.

The Altshuler approach was to connect the terminating resistor to a quarter wavelength element. If the far end of a quarter wave element is in free space, the near end appears as a low impedance. So it provides an electrical ground for terminating resistors. The drawback is that the quarter wave element is only a quarter wave long at one frequency and at twice this frequency it is a half wave and "disconnects" the resistor.

Guertler used multiple wire terminating wires to get a broader bandwidth. Treharne tapered the wires of

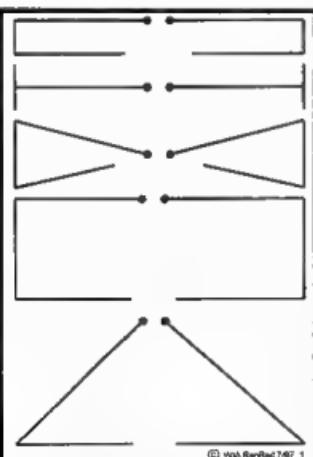


Fig 1 - Some ideas to shorten the length of a dipole.

Table 1

Resistance profile for 14 discrete loading points along the antenna.

Height (m)	Resistance (ohm)
0.208	0.419
0.625	0.489
1.041	0.581
1.458	0.699
1.874	0.859
2.290	1.080
2.707	1.401
3.123	1.889
3.539	2.689
3.956	4.129
4.373	7.131
4.789	15.102
5.205	49.473
5.622	786.910



Fig 3 - A shortened dipole using the winding form shown in Fig 4.

his sloping monopoles to maintain constant impedance and also used multi-wire terminations. Both used inductive shunts across the terminating resistors to extend the low frequency region. While both designs succeed very well, the bandwidth was still limited and efficiency was frequency dependent.

These antennas have essential constant-current levels from the feed point to the terminating resistor and are called travelling wave antennas. The conventional unterminated antenna has sinusoidal current variations with distance from the feed point and are called standing wave antennas.

In *Electronics World*, March 1997, Richard Formato describes a monopole design using small value resistors to load an element progressively and provide a broad band antenna. The example he gives is claimed to be twice as efficient as earlier continuously-loaded designs. Clearly the resistive loading absorbs power and reduces efficiency and the earlier designs which had a 5:1 frequency range had efficiencies that dropped to 10–15% in part of the range and often did not rise above 40%. Formato presents a design which he states has an average efficiency of 60% across the working range which is 36

MHz to 150 MHz for the 2:1 VSWR bandwidth. Useful operation from 11 to 150 MHz is claimed. The input resistance is 175 ohms.

The monopole exhibits 1 to 4 dBd from 10 to 150 MHz. Table 1 gives details of the loading resistors and their placement. It should be possible to scale the antenna. For example, by increasing the spacing by a factor of ten it should produce an antenna which would be useful from 1 to 15 MHz.

These values are theoretical values and, in practice, resistances could not easily be obtained any closer than 5% of the values. The total height is equal to a quarter wavelength at 12.86 MHz, which will be 5.832 m for a thin wire. For a vertical of practical thickness all dimensions will need to be reduced. For a 2 mm wire a factor of 0.95 is suggested.

The performance was calculated by Formato for operation above a perfect ground plane. In practice a large number of radials 2.3 m long are suggested. Two monopoles could be used to give a wide-band dipole.

Multi-Delta Antennas

Mark VK4MFX sent me a photocopy of an article from *Practical Wireless*, August 1995. Thanks Mark. In the

article, Denis Payne G3KCR examines ways of reducing the length of dipole antennas.

The ends of a dipole can be bent so as to run at right angles, or, provided the spacing is not too small, run back parallel to itself. In the latter case the current near the end of the wire is smaller than the current closer to the feed point, so, although some cancellation of the radiated field may occur, the relative loss is acceptable. Some examples of more complex folding include dipoles in the shape of a rectangle, triangle or even a bow tie. Two wires at right angles to each other, placed at the end of a shortened dipole will provide capacitance to resonate the antenna. These designs are shown in Fig 1.

Denis has come up with a design that reduces the length of the dipole but, he claims, still maintains bandwidth and efficiency. Fig 2 shows a series of triangular loops, each one wound in the opposite direction to its neighbour. Figs 3 and 4 show the design Denis used for a 21 MHz dipole.

The loading coils have each turn alternately wound in opposite directions with capacitance hats to complete the arrangement. The coil is wound on a 25 mm diameter former with panel pins spaced at 43 mm along the former. The wire is 0.6 mm PVC insulated single strand copper. The capacitance hats are four 180 mm long rods, 3 mm in diameter. No other details are given.

How does this work?

Well, here is my interpretation of the operation. As the turns are separated by 43 mm their coupling factor is considerably less than one. The inductance would be very close to zero if they were perfectly coupled. As the field of one turn is not completely cancelled by the field of the adjacent coil we do have some net inductance, although there is much more copper used than would be the case if the coil were wound as a solenoid.

The Q of the coil will be reduced because of the higher resistance and also because some of the energy in the coil will be lost as radiation. This will give a broader bandwidth for the 2:1 VSWR points. I'm not sure that the efficiency will be improved by this arrangement; indeed, I anticipate that it might be less

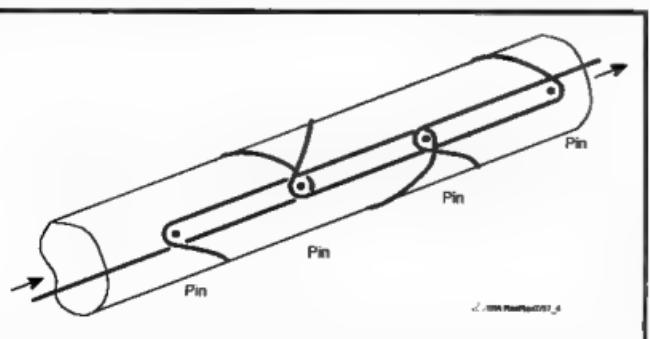


Fig 4 - Winding details of the shortened dipole.

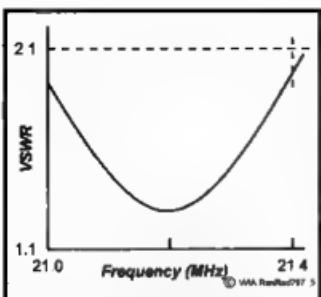


Fig 5 – VSWR curve of the 21 MHz antenna shown in Fig 3.

than a conventional coil and capacitance hat system. The increased bandwidth could be sufficient compensation for the increased complexity and probable small drop in efficiency.

The VSWR curve of the 21 MHz antenna is shown in Fig 4. Good results were obtained with QSOs into Europe.

The original triangular shape can be modified and a thin pyramid or tilted cube structure formed. Fig 6 shows Denis's 28 MHz version. He gives the overall length as 1.65 m and the feed resistance as 36 ohms. Contacts into the USA were one S point up on a ground plane. The 2:1 VSWR bandwidth is more than 1 MHz.

Unfortunately, there were no other construction details on this version. The intrepid experimenter will probably not be daunted by this as usually such a person adapts all design to suit available materials and personal preferences.

As always, your contributions to this column are sought. If sending in computer printouts, please note that antenna patterns printed with dot matrix printers will often prove impractical for reproduction, in which case you should describe the salient features in the main text.

*C/o PO Box 2175, Caulfield Junction, VIC 3161

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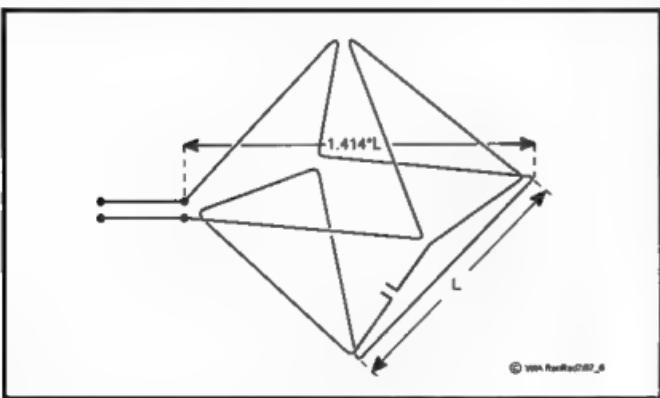


Fig 6 – A 10 m diamond cage antenna.

Sign up a new WIA member today – we need the numbers to protect our frequencies and privileges

WIA News

Radio Sports on the Move

The sport of Amateur Radio Direction Finding (ARDF) is growing in followers and participants around Australia, as it is around the world. Equipment used at the Region 3 Championships held in Townsville last year (see *Amateur Radio*, September 1996, page 7) has been distributed around, with one set of four transmitters now residing with enthusiasts in Melbourne and the remaining sets in Queensland.

WIA Federal Radio Sports Coordinator, Wally Watkins VK4DQ, advises that the Girl Guides in Adelaide are showing some interest in ARDF and hopes their efforts will meet with success.

In August, Wally will be demonstrating ARDF at the Riverina Convention in Wagga Wagga, NSW, which is being held over the weekend of 9-10 August. On his way down to the Riverina event, Wally will fly the Radio Sports flag at the Sunshine Amateur Radio Club in northern NSW at the meeting on 5 August. Wally is a very entertaining presenter and his talks are always well supported with equipment, photos and videos. He is prepared to visit any club on his return journey from Wagga, to demonstrate equipment and answer questions. Contact him QTHR, or phone/fax: 079 41036.



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■ UHF/Microwave

UHF/Microwave Activity in Australia

Dr Walter J Howse VK6KZ* gives a detailed run-down on what is happening on UHF and microwave in Australia.



Summary

This article describes the current state of UHF/Microwave activity in Australia. Information is provided about propagation opportunities, distances worked, individual operators and equipment used. This article is based on observations by the author over an extended period, backed by visits during March 1996 to the most active microwave enthusiasts in southern and eastern Australia and aided by comments by other active operators during August 1996.

For the purpose of this article, the term "UHF/microwave" includes the bands from 1296 MHz up. Information about 1296 MHz FM, and FM repeaters, is not covered.

The first thing about these bands is that it is difficult to purchase commercial

equipment for them. Quite a number of the amateurs mentioned in this article have become very proficient in obtaining components and surplus equipment from specialist Australian suppliers and from overseas. Many would be very willing to assist others in building, testing and operating equipment on these higher bands.

The Equipment Supplies Committee of the Wireless Institute of Australia (run by the Elizabeth Radio Club) has played a very significant role in assisting Australian amateurs obtain components for home construction and for kits for some of the frequencies. They have their catalogue on the internet at http://dove.net.au/~mark1/sa_vhf/esc_index.htm

In addition to *Amateur Radio*, most of

the active microwave constructors subscribe to (or read) more specialised publications. The most common journals are *QST*, *QEX*, *Radcom*, *Dubus*, *VHF Communications*, *North Texas Microwave Newsletter* and *RSGB Microwave Newsletter*. Many also have access to the Internet and use this for both e-mail and sourcing information.

Centres of UHF/Microwave Activity

Proceeding in an anti-clockwise fashion around Australia, starting on the west coast in Geraldton (378 km north of Perth), Neil Sandford VK6BHT operates on 10 GHz and 24 GHz with 5.7 GHz under construction. Neil was formerly VK4ZT and held the national 1296 MHz record of 402 km from 1970 to 1971. He also holds the call VK1ZT. In Perth (population 1.2 million), those with equipment on 1296 MHz and above include Don Graham VK6HK, Alan Woods VK6ZWZ, Al Edgar VK6ZAY, Bruce Douglas VK6BMD and the author VK6KZ. On the south coast of Western Australia, Wally Green VK6WG in Albany has equipment for all bands to 10 GHz.

Adelaide (population 1.1 million) has beacons on 144 MHz, 432 MHz and 1296 MHz, 2.3 GHz and 10 GHz with beacons under construction for 3.5 GHz and 5.7 GHz. Those with equipment for 2.4 GHz and higher include David Minchin VK5KK, Roger Bowman VK5NY and Des Clift VK5ZO. Des Clift, under previous callsigns VK2AHC and VK5CU, held national records for 2.3 GHz (160 km 1973), 3.5 GHz (14 km 1977), 5.7 GHz (114 km 1975) and 10 GHz (114 km 1975).

Just south of Adelaide is Eric Jamieson VK5LP who has an international reputation as the author of the *VHF/UHF - An Expanding World* section of *Amateur Radio* magazine for nearly 28 years. Eric is very active on the VHF/UHF bands. A keen portable operator in his earlier days, he is now confined to a wheelchair which prevents him from operation on 10 GHz.

In south-eastern South Australia, active amateurs include Trevor Niven VK5NC and Chris Skeer VK5MC. Trevor, at Mt Gambier, is about 139 km from Russell VK3ZQB, 415 km from Melbourne and 350 km south of

Adelaide. Chris is active on 1296 MHz EME.

In western Victoria, Russell Lemke VK3ZQB is at Port Fairy, 295 km from Melbourne. In Melbourne (population 3.2 million) there are many SSB stations on 1296 MHz with emerging activity on the higher bands. Amateurs with equipment for the latter include Les Jenkins VK3ZBJ, Alan Devlin VK3XPD, Ian Berwick VK3ALZ and John Martin VK3KWA. In eastern Victoria, Rob Ashlin VK3DEM in Bairnsdale (270 km east of Melbourne) is active on 1296 MHz and 2.4 GHz, the latter being via an Icom 970.

Moving to New South Wales, Lyle Patison VK2ALU is active on 10 GHz EME in Wollongong, approximately 100 km south of Sydney. Activity on the higher bands in Sydney (population 3.7 million) is limited with 1296 MHz stations including Ross Usher VK2ZRU, Mike Farrell VK2FLR and Gordon MacDonald VK2ZAB. Alan Avery VK2AXA, Bill Cox VK2ZAC and Gary Beech VK2KYP operate on 10 GHz. About 280 km north of Sydney on the coast at Taree is R Barlin VK2DVZ who has EME potential on 1296 MHz.

In the Queensland capital of Brisbane (population 1.4 million), there are about 15 people with 1296 MHz SSB who include Rod Preston VK4KZR, Adrian Pollock VK2FZ/4, Glen McNeil VK4TZL, Doug Friend VK4OE, and Kim Harwood VK4KBH. Several are active on the higher bands.

In addition to a low population, there is little activity on the UHF/microwave bands across the northern part and the inland of Australia. The real enthusiast is Rex Pearson VK8RH in Darwin in the Northern Territory who has the only 1296 MHz and 2.3 GHz equipment in town! Maybe he will add 1296 MHz TEP contacts to those already achieved on 144 MHz to Japan!

Propagation Opportunities

Perhaps the still most well-researched study of propagation around the Australian coastline was that carried out by Kerr¹. His report was based on observations from 112 Royal Australian Air Force 200 MHz air warning radar stations near the coast of Australia during the period March 1944 to August 1945. It

was demonstrated that ducting in summer often extends over a large area of southern Australia simultaneously. The effects of ducting were most striking in north-west Australia and these peaked in winter. Conditions down the eastern coast of Australia produced infrequent ducting in the summer months. Interestingly this report was referred to in *Amateur Radio* for May 1950 but its significance appears to have been ignored.

Amateurs did not exploit the path across the Great Australian Bight until the WA VHF Group (Inc) installed a 144 MHz beacon in October 1968 at Mt Barker, 50 km north of Albany. This led to the first of many contacts on 144 MHz between Albany and Adelaide. This first QSO² was between Wally Green VK6WG and Mick McMahon VK5ZDR on 3 January 1969. Subsequently, the Great Australian Bight has been bridged on a number of the other amateur bands with first contacts made on:-

432 MHz on 11 December 1972 between VK6WG and VK5ZDY;

1296 MHz on 25 January 1977 between VK6WG and VK5QR;

2304 MHz on 17 February 1978 between VK6WG and VK5QR;

3456 MHz on 25 January 1986 between VK6WG and VK5QR; and

10368 MHz on 30 December 1994 between VK6KZ/p and VK5NY/p.

In addition to the Albany/Adelaide path of about 1885 km, contacts have been made over longer distances from points in the south west of WA as far west along the coast as Cape Leeuwin (on 144, 432 and 1296 MHz) by VK6KZ/p, and as far north from Perth (on the same bands) to points south and east of Adelaide and into Victoria. These contacts all cross the Bight and the longest distances worked have reached:

2223 km on 144 MHz, VK6HK Perth – VK3AUU South Drouin;

2715 km on 432 MHz, VK6KZ/p Cape Leeuwin – VK3ZBJ Melbourne;

2449 km on 1296 MHz, VK6WG Albany – VK3ZBJ Melbourne; and

1912 km on 10368 MHz, VK6KZ/p Torbay – VK5NY/p south of Adelaide.

These openings were dependent on the presence of a high pressure cell in the Great Australian Bight. For example, the weather map of 16 March 1988³ (see Fig

1) was provided in a paper by Jamieson illustrating the conditions of "a virtually stationary and typical high pressure system which produced outstanding results from Albany to Adelaide and Melbourne over a period of four days on all bands to 3.5 GHz".

Contacts have been made along the north/south path along the Western Australian coast on 144 MHz from Cape Leeuwin as far north as Northwest Cape (1400 km). On 10 GHz, Neil Sandford VK6BHT in Geraldton and the author had 16 contacts and three incomplete ones over 27 days during the Ross Hull Memorial VHF/UHF Contest in December 1995/January 1996.

Along the north west Australian coast, there are very few amateurs using VHF SSB; the main activity is on 144 MHz FM. Contacts over 1000 km are frequent. Stations in Karratha and Port Hedland have also worked amateurs in Indonesia at Denpasar, Bali over a 1300 km path on FM.

Activity on the Bands

1296 MHz Band

As in other countries, much of the early work on this band was based on varactor diode multipliers from 432 MHz using FM or CW. Having generated some power at 1296 MHz, air-cooled power amplifiers of the 2C39 variety were often used.

The two Australian amateurs noted for pioneering long distance contacts on bands from 1296 to 3456 MHz, along with unsuccessful efforts on 5760 MHz using this type of equipment, were Wally Green VK6WG based in Albany, Western Australia and Reg Galie VK5QR in Adelaide, South Australia. They were responsible for establishing world record distances of 1885 km across the Great Australian Bight on the lower three bands in the period 1977 to 1986. As mentioned earlier, the 1296 MHz contact was made on 25 January 1977, on 2304 MHz on 17 February 1978, and on 3456 MHz on 25 January 1986.

These world records stood for many years until the 1296 MHz one was broken by Chris Skeer VK5MC and the author, and then the others by Chip Angle NGCA and Paul Lieb KH6HME. Reg and Wally made a number of attempts to

repeat their home-to home contacts on 5.7 GHz without success

While CW was the main method of communication, SSB was generated by the Karl Meinzer DJ4ZC method involving division of an SSB signal at 20 MHz and then multiplication to the final frequency to restore the audio⁵. This used a division factor of three in generating a 1296 MHz signal. VK5QR re-designed this to give a division factor of six in order to produce SSB on 2304 MHz⁶. What is remarkable about these two operators is that they developed their equipment while separated by 1885 km and with no similarly inclined amateurs in their area. Additionally, neither has any professional training in radio and electronics. Reg Galle being a former high school teacher of English and Wally Green being a former tradesman working in the electrical, mechanical, fitting, machining and welding areas before retiring from his position as plant inspector. These two amateurs are still active at the age of 85 years. Wally Green has 10 GHz SSB equipment and is hoping to extend the author's 10 GHz world record!

Although there was similar varactor-oriented technology in use at that time by other operators elsewhere in Australia, none has stood out as much as these two.

Current technology in use is either home built transverters or commercial transceivers. A number have built the water cooled 2C39 design by Chip Angle N6CA; these were used by Cec Andrews VK6AO in Perth and Trevor Niven VK5NC at Mt Gambier in their SSB contact of 2364 km in February 1996, and by R Barlin VK2DVZ in Taree when working New Zealand. The late Dick Norman VK2BDN also worked ZL1AVZ in New Zealand over a 2132 km path in 1982.

EME activity began with Ray Naughton VK3ATN and then followed by the late Ron Wilkinson VK3AKC. Lyle Patison VK2ALU led the Illawarra Amateur Radio Society which operated EME under the callsign VK2AMW on 1296 MHz EME with 120 watts out to a nine metre dish from 1982 to about 1986. Chris Skeer VK5MC is the only current known operator.

With the more readily available "black box" technology for 1296 MHz (and much of it used on FM through

repeaters!) little further comment needs to be made on that band other than to draw attention to the extensive use made of aircraft paths to enhance signals and make routine SSB contacts over 600 km⁷. This is ably demonstrated each year in the near month-long Ross Hull VHF/UHF Memorial Contest when operators in Melbourne, Canberra, Sydney and Brisbane make contacts on 144, 432 and 1296 MHz at times based on the commercial airlines' timetables and flight paths. To the best of the author's knowledge, no one has yet tried the 2304 MHz band. Neil Sandford VK6BHT in Geraldton, 380 km north of Perth, did look at flight schedules with a view to trying aircraft enhancement with the author in Perth on 10 GHz but, unfortunately, the flight path was too far to the east to be successful.

2304 MHz Band

In addition to VK6WG, two Western Australian amateurs, Don Graham VK6HK and the author, built varactor multiplier-type transmitters for the 2304 MHz band and had contacts over distances of up to 274 km. Current activity on 2304 MHz in capital cities in Australia has had to be curtailed as pay television by MDS now overlaps the original narrow-band section.

Encouraged by the amateur satellite service Mode S, a number of people have built 2400 MHz receivers. For a while the Equipment Supplies Committee (referred to earlier) made available transverter kits based on the YU3UMV design⁸ which enabled a number of VKs to transmit low power (500 mW) SSB signals. In Western Australia there are about three keen enthusiasts using such gear for terrestrial work up to about 150 km. The current kits are receive-only and are based on a design by VK5WA/VK5EME.

Alan Devlin VK3XPD and David Minchin VK5KK have transmitters producing five watts, and the former is carrying out tests with Rob Ashlin VK3DEM over the 270 km path.

In Queensland last summer, Doug Friend VK4OE with an Icom 970E, 1.5 watts and a 45 element loop Yagi, worked Adrian Pollock VK2FZ4 who used a Down East Microwave transverter kit and five watts into a similar antenna over

a distance of 213 km for a new VK4 distance record.

3456 MHz Band

Although VK6WG, VK6HK and the author still have their original varactor multiplier equipment, activity on 3456 MHz is about to "explode" with a number of amateurs having completed (or have close to completion) transverters based on the Michael Kuhne DB6NT design⁹ with about 250 mW power out. Oscillator injection is obtained using a Sam Jewell G4DDK001 design¹⁰ followed by a MGF1302 tripler. On 10-11 August 1996, successful tests were carried out over a 130 km path using these transverters with a 600 mm dish and PCB triband feeds. Those involved were Alan Devlin VK3XPD, Russell Lemke VK3ZQB, Trevor Niven VK5NC, David Minchin VK5KK, and Colin Hutchesson VK5DK. Both VK3XPD and VK5KK have five watts capability with MGF0904/5s.

In Perth, Al Edgar VK6ZAY has designed and built his own transverter with about 50 mW output.

5760 MHz Band

The current Australian distance record¹¹ for this band is 191 km between D Apted VK7DA/p and Steve Hutcheon VK4ZSH/pVK7 made on 20 January 1991; this reflects the limited activity on that band. Steve used varactor multipliers. He travelled to VK1, VK2 and VK3 to establish records for those States as well as his home State of VK4. The record distance for VK5 is 176.4 km between N Tebneff VK5NT and Des Clift VK5ZO on 12 Nov 1989. There are no claims for VK6 or VK8.

As mentioned earlier, Reg VK5QR and Wally VK6WG made a number of unsuccessful attempts to bridge the Great Australian Bight on 5760 MHz. Their equipment used varactor multipliers but Wally Green did build two valve amplifiers based on the YD1060 tube. Don Graham VK6HK and the author built and still use varactor based equipment for this band.

In the last few years, a number of surplus 6 GHz receivers became available and several of these have been converted into low power SSB transmitters with a second one adapted

as a receiver. Al Edgar VK6ZAY and Alan Woods VK6ZWZ, using such equipment, have worked up to 150 km using coastal ducting.

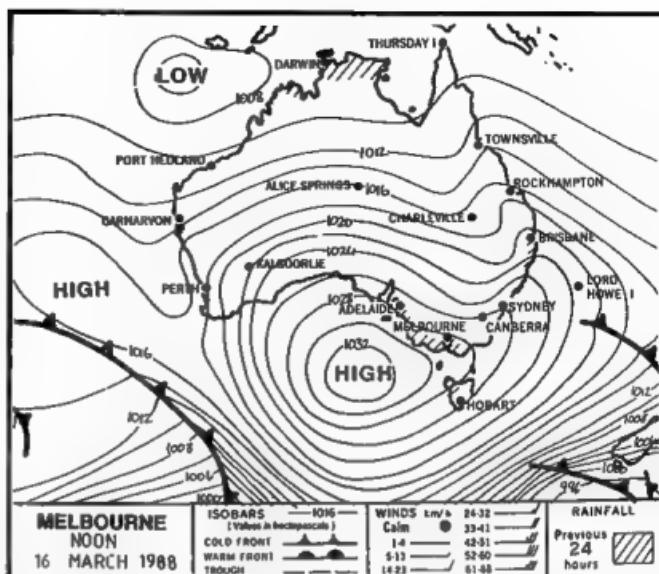
A concerted effort is being made by a group of amateurs in VK3, VK5 and VK6 to construct 5760 MHz transverters based on a DB6NT design¹². The oscillator source is a Sam Jewell G4DDK006 design¹³ with two MGF1302s following to 5616 MHz. Some of the completed transverters were used successfully on 10-11 August 1996 over the 130 km path, with the same dishes mentioned above, for 3.5 GHz. VK3XPD is experimenting with IMFET IM5964-3s to generate higher power and is building a hybrid combiner to use five of these devices to produce 16 watts.

10 GHz

Early pioneers of this band include Lyle Patison VK2ALU and Des Clift VK5ZO (formerly G3BAK, VK5CU and VK2AHC), Bill Cox VK2ZAC and the late Dick Norman VK2BDN. Their work was carried out with klystrons like the 723A/B and later Gunn diodes, gunnplexers and narrow-band waveguide mixer transverters. Des is believed to have had the first QSO on 10 GHz in Europe in about 1950, and in Australia in the late 1960s. He has published articles and contributed to RSGB VHF/UHF Manuals, given many lectures on microwaves and currently provides a lot of assistance (and components) with antennas and feeds. The first 10 GHz operators in Western Australia in the early 1980s were Colin Murphy VK6CM and Roger Nottage VK6NR who used gunnplexers to work distances up to about 70 km.

In 1992 Barry Grey VK6ZSB built and later published⁴ the design for a 10 GHz transceiver based on an X-band alarm module with a 5 mW Gunn diode and in-line diode detector. The article included PCB layouts to allow home construction and 25 boards and modules were sold by Barry. There was a flurry of activity using these but the novelty appears to have worn off and those remaining in use are probably in point-to-point voice and/or data links.

Also in 1992 some surplus surveying tellurometers (Model MRA301) became available. These were constructed around a klystron providing 30 mW



Weather map of 16 March 1988

output between 10.05 and 10.45 GHz. Quite a few amateurs got their first taste of 10 GHz through these and some of the activity was focused on extending the Australian distance record. The Australian distance record for this band remained at 114 km from 1975 until it was extended to 170 km in 1981. Before tellurometers were used to accomplish greater distances, narrow-band designs became available.

The designs by Charles Suckling G3WDG¹⁵ and Michael Kuhne DB6NT¹⁶ demonstrated that stable SSB equipment with higher power and improved noise figures for reception were within the capabilities of experienced amateurs. In the case of the Suckling design, the availability of critical components from the UK Microwave Committee Component Service was significant. Independently of, and unknown to each other, in Western Australia, Neil Sandford VK6BHT in Geraldton and the author chose that design while David Minchin VK5KK and Roger Bowman VK5NY chose the DB6NT route and these were joined by Trevor Niven VK5NC, Chris Skeer VK5MC, Russell Lemke VK3ZQB and Alan Devlin VK3XPD.

The first contact by the author with SSB was with VK6BHT/p over a 378 km path for a new Australian distance record, beating one of 290 km made between VK5NY/p and Chris VK5MC. This distance¹⁷ was then extended in a flurry of contacts in 1994 in VK3, VK5 and VK6 until the current world record of 1912 km was achieved by Roger Bowman VK5NY/p (with 180 mW) and the author (100 mW and both with 450 mm dishes) on 30 Dec 1994. Since then VK6BHT and the author have added the G3WDG006 amplifier to get in excess of 200 mW while VK5NY has upped his power to one watt.

Wally Green VK6WG in Albany has a Toshiko Takamizawa JE1AAH transverter¹⁸ with a G3WDG006 amplifier. He is well placed to break the world record. In Sydney the DB6NT design has been followed by Alan Avery VK2AXA and Garry Beech VK2KYP. Bill Cox VK2ZAC is using the Zack Lau KH6CP/1 design and Ross Usher VK2ZRU has modified satellite LNBs to get a transceiver. Alan VK2AXA also has a G3WDG transverter. Recently a number of amateurs have obtained Qualcomm amplifiers and have retuned these to 10 GHz with power output levels

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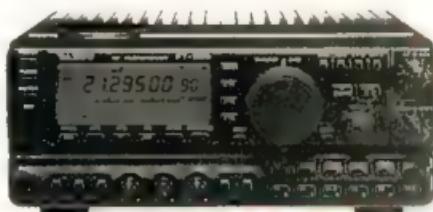
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Weight: 2.3kg
Suitable mast: 28-60mm diameter
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Specifications

Frequency Range

RF Output:

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of about one watt. Complete Qualcomm units are being imported from the USA and a number of other operators are expected to appear on the band or to upgrade their power levels.

As far as EME is concerned, there are two operators. Lyle Patison VK2ALU in Wollongong about 100 km south of Sydney and Alan Avery VK2AXA in Sydney. Alan Devlin VK3XPD will soon have EME capability with a 50 watt TWTA into a two or three metre dish. Roger Bowman VK5NY has been experimenting with two TWTA's but has not publicly committed himself to using these for EME.

After working Jim Vogler WA7CJO using a 1.75 metre dish and a Siemens RW1125D TWTA providing 16 watts¹⁹, Lyle was determined to work Charles Suckling G3WDG on 10 GHz EME. In order to overcome site limitations in the direction of Europe, Lyle mounted his 3.7 metre EME dish with a Gregorian feed on a car trailer which is towed from its parked position at the side of the house to the front of his driveway. Lengthy control cables run from the transmit and receive equipment mounted at the rear of the dish to the receive/transmit IF of 144 MHz and the control circuitry in his garage. Lyle worked Charles Suckling G3WDG and Petra Suckling G4KGC on 18 August 1996 over a 17000 km path.

Lyle has a one watt portable station based on the G3WDG design (Lyle was a beta tester of portions of that transverter). Lyle holds the VK1 and VK2 distance records with a contact of 218 km to Bill Cox VK2ZAC by operating portable from Canberra.

Alan Avery VK2AXA is located in the northern suburbs of Sydney. He is completing a 10 GHz EME station using a TWTA sent originally to Adrian Pollock VK2FZ. Due to zoning restrictions on the use of an approximately four metre dish, it is mounted on a cliff face at the back of a family property and is painted green and black so as to be inconspicuous.

24 GHz

Several amateurs are known to have experimented in this band using Gunnplexers. These included Keith Bainbridge VK6XH and Greg Hateley VK6YBI in Perth. Ashley Anderson VK2XSO in Sydney used wide band FM

klystron tellurometers to work 40 km from Kurrajong on the edge of Sydney down to Castle Hill.

Wideband 24 GHz gear with about 40 mW and a small horn is about to be tested by Alan Devlin VK3XPD, Russell Lemke VK3ZQB, Trevor Niven VK5NC and David Minchin VK5KK.

At this time, the only two narrow-band operators are Neil Sandford VK6BHT and the author, VK6KZ. They decided to operate on the 24048 MHz portion of the band. First contacts were made using the DB6NT Mark 2 transverter design²⁰ with about 400 microwatts output and at distances to 69 km. The oscillator chain used the G4DDK006 design with a G3WDG009 multiplier²¹ to obtain injection of 11952 MHz. Neil then built, for the author and for himself, HEMT power amplifiers (again a DB6NT design with board obtained from the UK Microwave Committee Components Service) comprising a 2SK1844 HEMT followed by two MGF1303s and finally two MGF1303s in parallel. These are used with a four port waveguide switch in both the receive and transmit roles. With these, tests were carried out up to distances of 86 km on 6-7 July when Neil was in Perth. Serious testing with ducting along the Western Australian coast commenced in the summer of 1996/97.

Above 24 GHz

The Australian record distance for 47 GHz is 18.3 km between Alan Anderson VK3KAJ/p (now VK3CV) and K Harbeck VK3ZKH, with the contact made on 9 February 1995. It is believed they used Gunn diode technology.

No activity has been reported on any higher bands.

Concluding Comments

Despite its vastness and low overall population, Australia has microwave operators who make up for their lack of numbers with undeniable enthusiasm. Nowhere more visible than this enthusiasm has been the occasions when the author has been portable along the south coast of Western Australia. Hourly skeds during the night accompanied by long distance driving (for example, Roger VK5NY and David VK5KK covering 400 km before returning home

the next day) or tenacity such as exhibited by Trevor VK5NC who worked Cec Andrew VK6AO in Perth on 1296 MHz SSB over a distance of 2364 km within five hours (at 01.44 local time) of returning from hospital after a heart attack. After a further three hours he went out portable to carry out unsuccessful tests over a 2050 km path on 10 GHz with the author who was portable near Albany.

The less visible enthusiasm is that shown by the individuals building the gear often without, or access to, sophisticated test equipment.

It is hoped that the successful launch of the Phase IIID satellite will encourage more activity on the microwave bands for both satellite and terrestrial working.

Acknowledgments

The author thanks the many amateurs who offered hospitality on his interstate travels and, in particular, Don Graham VK6HK, David Minchin VK5KK, Eric Jamieson VK5LP, Alan Devlin VK3XPD, Lyle Patison VK2ALU, Alan Avery VK2AXA and Rod Preston VK4KZR who provided comments on an earlier draft of this paper. The author remains responsible for any errors.

References

- (1) Kerr F J, "Radio Super-refraction in the Coastal Regions of Australia", *Australian Journal of Scientific Research (Physical Sciences)*, Dec 1948, pp 443-463.
- (2) West Australian VHF Group Bulletin, May 1969, p 3.
- (3) Commonwealth Bureau of Meteorology, Australia.
- (4) Jamieson E, "Propagation on the Bands 50 MHz to 1296 MHz", unpublished paper presented to South Australian Technical Symposium, South Coast Amateur Radio Club, Saturday 24 July 1993, p 12.
- (5) Menzies K, "An SSB Transmitter for the 13 Cm Band", *VHF Communications*, 3/1971, pp 172-176.
- (6) Galle R V, "A New Method of Frequency Multiplication for VHF and UHF SSB", *VHF Communications*, 2/1979, pp 76-84.
- (7) McArthur Doug, "Aircraft Enhancement of VHF/UHF Signals", *Amateur Radio*, July 1985, p 4-6 (for details of 144 and 432 MHz), and

Suckling Charles, "Microwaves: Aircraft scatter propagation", *Radcom* May 1983, p 434.

(8) Vidmar Matjaz, "Microstrip Transverters for 23 and 13 cm", *VHF Communications*, 2/1986, pp 96-107 and 3/1986, pp 143-164.

(9) Kuhne Michael, "Transverter for 3.4 GHz", *Dubus Technik III*, 1992, pp 163, 291-300.

(10) Jewell S T, "Microwaves: A local oscillator source", *Radcom*, March 1987, pp 199-201; see also Dixon M W, *Microwave Handbook Volume 2*, *Radio Society of Great Britain*, 1991, pp 8.8-8.12.

(11) "VHF/UHF Records", 1996 *Call Book*, *Wireless Institute of Australia*, p 46.

(12) Kuhne Michael, "Transverter for 5.7 GHz", *Dubus*, 3/1991, pp 11-23.

(13) Jewell S T, "An oscillator/multiplier chain for the frequency range 2.0 to 2.6 GHz", *Radcom*, August 1990, pp 35-38; see also Dixon M W, *Microwave Handbook Volume 2*, *Radio Society of Great Britain*, 1991, pp 8.12-8.16.

(14) Grey Barry, "Build a wideband FM TV transceiver for 10 GHz", *Amateur Radio Action*, Vol 15 No 12, pp 36-40.

(15) Suckling Charles, "Modern 10 GHz transverter System Part I", *Dubus*, 3/1993 pp 22-33; "Part II" *Dubus*, pp 4/1993, pp 21-46; "Part III", *Dubus*, 1/1994, pp 5-22; see also Dixon M W, *Microwave Handbook Volume 3*, *Radio Society of Great Britain*, 1991, pp 18.100-8.

(16) Kuhne Michael, "A Simple 10 GHz Transverter", *Dubus*, 1/1991, pp 3-11.

(17) Jamieson E, "VHF/UHF - An Expanding World: World Record 10GHz Contact", *Amateur Radio*, February 1995, p 46.

(18) Takamizawa Toshiko, "10 GHz T/R Module", *Dubus*, 2/1990.

(19) "Activity News: Australia to the USA via the Moon", *RSGB Microwave Newsletter*, October 1994, p 11.

(20) Kuhne Michael, "Simple transverter for 24 GHz (MKII)", *Dubus*, 1/1993, pp 5-9.

(21) Suckling Charles, "WDG009 Multiplier", unpublished.

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■ Book Review

The CB PLL Data Book

Publisher: CB City International

Author: Lou Franklin K6NH

Reviewed by: Peter Parker VK1PK*

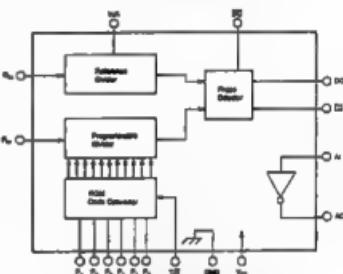
Rising solar activity will mean better conditions soon on ten metres. While it will be a year or more before the band reaches its peak, sporadic-E propagation makes solid interstate contacts possible even in low sunspot years. A lot of power and a big antenna is not necessary, and many operators find that a 27 MHz CB radio converted to ten metres is ideal, particularly for mobile and portable operation. Converting CB radios to ten metres is neither difficult nor expensive, but there are traps for the unwary. These include some newer radios not being easily modifiable, and information on many sets being hard to come by.

The eighty-page CB PLL Data Book should help the newcomer grasp what is involved in converting a CB to ten. Indeed, it should be possible to modify many models of set, armed solely with the information contained within the book. The first section contains a thirteen-page explanation of phase-locked loops, with particular reference to CB radios. The author's clear, crisp writing style is definitely a plus, and I would commend the chapter for those seeking to understand the operation of phase locked loops and frequency synthesisers.

The next section talks about modification methods. This is eighteen pages long, and goes through various means to modify radios, including altering division ratios, changing crystal frequencies, EPROMs, etc. Coverage is also given to truth tables and binary programming. It points out that the simpler the CB PLL circuitry, the harder it is to modify, and those with a single 10.240 MHz crystal are almost impossible to convert.

THE CB PLL DATA BOOK

Lou Franklin



A Repair & Modification Reference

Includes American, British, & European CB Radios
AM, FM, SSB, CW modes

Most of the rest of the book contains information about specific PLL circuits and ICs used in American, European and even Australian CB models. The book was last revised in 1991. Unfortunately only block diagrams are given; it would have been good to have complete circuits for those who want to use ex-CB PLL chips in homebrew projects.

Overall, I would recommend the book as a good starting point for licensed amateurs interested in modifying CB radios or learning more about frequency synthesisers.

The review copy cost \$19.95 and was supplied by Dick Smith Electronics.

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ALARA

Sally Grattidge VK4SHE*, ALARA Publicity Officer

Life for Christine

Jean VK5TSX

The VK5s changed their normal monthly luncheon in April so that it could include the presentation to Christine VK5CTY of Life Membership of ALARA. The excuse given to Christine for the change of date was that, as it was school holidays an extra body or two may be able to attend, and she fell for it.

There was an excellent turn up; Lorraine VK5LM and OM came down from Mallala, Jenny VK5ANW rearranged her lunch break, and Maria VK5BMT was actually in Adelaide for the event. Jean VK5TSX had such a long lunch break, she never made it back to work, and there were twelve members present altogether.

It was a momentous occasion, and Christine was rendered speechless, not just for a moment, but for a full twenty minutes! Tina VK5TMC had made up a certificate and had it framed to be presented by Denise VK5YL, and Jean produced a cake which was cut by Christine with great ceremony. A good time was had by all, and the whole affair got a mention on the local Sunday morning broadcast as well.

Christine has worked for ALARA for the past eight years in the positions of Minute Secretary, Vice President, and most recently as President, always devoting time and effort far in excess of the duties as prescribed. Congratulations again Christine.

Christine and OM Geoff are currently overseas exploring ruined castles, admiring great cathedrals and even experiencing real snow!

A Little Bit of DX

Tiny ON4CAT, president of the Belgian YL Club, tells me that the club is having a special event station on 21 July with the callsign ON4YLC. On 26 and 27 July the club will be active again for two days from an International Hot Air Balloon Meeting using the callsign ON4EBM (Eelko Balloon Meeting).

Lydia DF3BN says there is an active YL packet net in Germany, so if you send bulletins mentioning YL in the subject you will mostly likely reach them.

New Committee

ALARA's AGM was held Monday, 26 May on 3.5775 MHz in remarkably good conditions. Incoming president Judy VK3AGC did a great job controlling the net, as we all knew she would, and may have set

some kind of record for the shortest AGM ever held.

On the net were Judy VK3AGC, Bev VK4NBC, Gwen VK3DYL, Bev VK6DE, Poppy VK6YF, Mary VK3FMC, Marilyn VK3DMS, Robyn VK3ENX, Meg VK5AOV, Margaret VK4AOE, Jean VK5TSX, Tina VK5TMC, Maria VK5BMT, Val VK4VR, Sally VK4SHE, June VK4SJ, Bron VK3DYF, Pat VK3OZ/5 and Dot VK2DDB.

Office bearers are as follows: Executive President, Judy VK3AGC; Senior Vice President, Bev VK4NBC; Junior Vice President, Margaret VK3DML; Secretary, Tina VK5TMC; Treasurer/Souvenir Custodian, Margaret VK4AOE; Minute Secretary, Bron VK3DYF; Publicity Officer, Sally VK4SHE; Newsletter Editor, Dot VK2DDB; Awards Custodian, Jessie

VK3VAN; Contest Manager, Marilyn VK3DMS. Sponsorship Secretary, June VK4SJ; and Librarian, Kim VK3CYL. State Representatives are: VK1/2, Dot VK2DDB; VK3, Bron VK3DYF; VK4, Robyn VK4RL; VK5/8, Jean VK5TSX; and VK6, Bev VK6DE.

The position of Historian is not filled but may be taken by Christine VK5CTY, who has been deeply involved with ALARA's History Project. Margaret VK4AOE has agreed to another year as Treasurer, but will definitely go after that, and is very willing to assist anyone who would be prepared to do the job, but perhaps does not feel confident about handling it. Sally VK4SHE would like to vacate the position of Publicity Officer after this year, also. We have no VK7 Representative at this time, so any VK7 member reading this please volunteer.

C/o PO Woodstock QLD 4816

Tel: 07 788 642

Packet: VK4SHE@VK4RAT.MQ.QLD.AUS.OC

Internet e-mail: rgrattidge@gmail.com.au

or

QSP News

Birthday Greetings Scouts turn 90 JOTA turns 40

The 40th birthday of JOTA will occur on 18 and 19 October 1997. To celebrate the event the Scout Radio and Electronics Service Unit, in conjunction with several Victorian amateur radio operators, are going to give Jamboree On The Air an added meaning, with a big balloon launch.

The balloon is to carry several Special Radio Stations including a Voice Beacon, Packet Beacon and a four channel Cross Band Repeater.

The good thing about this is that Scouts can listen to the Voice Beacon during the flight from even simple VHF scanners. The Beacon Frequency is 145.700 MHz. Scout JOTA Stations are invited to use the Cross Band Repeater for JOTA contacts.

The Amateur Radio Fox Hunting Teams are planning to recover the equipment once it comes back to earth.

How about launching your own smaller balloons from your JOTA sites with a stamped self-addressed envelope and a message inviting the return of your payload.

Transmission mode will be FM. Output power will be 100 mW continuous which will increase to approx one watt for the data bursts.

There will be a four-channel cross band repeater which will operate on the following frequencies at approximately 100 mW per channel:

Channel	Uplink	Downlink
1	432.900	145.300
2	432.925	145.325
3	432.950	145.350
4	432.975	145.375

Launch will be on Saturday, 18 October 1997 at 11 am at the Police Paddocks VK3SAC campsite, dependent on weather.

The mode of transmission will be FM in all cases. Telemetry will be 1200 Baud Packet and FM voice. Estimated coverage will be NSW (VK2), VIC (VK3), SA (VK5), and TAS (VK7) when at peak altitude (line of sight coverage to sea level over flat terrain is approx 500 km at 20 km altitude, and 350 km at 10 km altitude - higher sites may extend the range up to a further 2-300 km). Antenna polarisation will be vertical, estimated peak altitude will be 20+ km, and estimated flight time is three hours.

Further details and (JOTA Badges) from the Scout Radio and Electronics Service Unit (Victoria), PO Box 311, Box Hill, VIC 3128.

Philip Adams VK3JNL
03 9438 3013 AH

AMSAT Australia

Bill Magnusson VK3JT*

National co-ordinator

Graham Ratcliff VK5AGR

Packet: VK5AGR@VK5WI

E-mail: vk5agr@amsat.org

AMSAT Australia net:

Control station VK5AGR

Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions).

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service

The newsletter is published monthly by Graham VK5AGR. Subscription is \$30 for Australia, \$35 for New Zealand and \$40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia

GPO Box 2141

Adelaide SA 5001

Keplerian Elements

Current keps are available from the Internet by accessing the AMSAT FTP site, <ftp://amsat.org> and following the sub-directories to "KEPS".

Geo-Stationary or Geo-Synchronous, What's the Difference?

The possibility of a future amateur radio satellite(s) being placed into a geo-stationary orbit is once again being discussed. The forthcoming P3D will be placed into a synchronous orbit. But what exactly do these terms mean?

It's easy to be confused by them and believe they are all interchangeable. In retrospect, it was Arthur C Clarke, of "2001: A Space Odyssey" fame, who noted (in 1945!) that a satellite in a circular, equatorial orbit with a radius of about 42,242 km would have an angular velocity that matched that of the Earth and would therefore appear, to an observer on the ground, to always stay in the same spot in the sky. That was 12 years before SPUTNIK-1 and 18 years before the first geo-stationary satellite was launched. Good work, Arthur!

The easiest way to visualise this is to recall

that most low-earth orbits require a satellite to go around the Earth some 13 to 15 times per day. At the other end of the scale we have a satellite like the Moon which orbits at about 1/28th of one orbit per day. The controlling variable is their altitude.

The low earth satellites are just outside the atmosphere, some 500 to 1000 km above the Earth. The Moon is, on average, between 358,000 and 400,000 km away. If it were closer it would orbit faster; if further away it would take longer than 28 days to complete one revolution.

It occurred to Clarke that, in between these two extremes, there should be an orbital height which would support an orbit of exactly ONE revolution per day. Well, as it turns out, he was correct. His contribution is honoured by the naming of the "Clarke Belt", a circle about 42,240 km radius and in plane with the equator. This is where all the geo-stationary satellites are orbiting. The result is, as Clarke suggested, that although they are racing around the Earth like any other, these satellites appear to be stationary to a ground based observer.

Now, satellites don't care what time it is on Earth. Their orbits are referenced back to the inertial sky, ie the star background, as is the Earth's real rate of rotation. The Clarke Belt is therefore at an altitude that supports approximately 1.0027 revolutions per (clock) day because that is what the Earth actually does in relation to the inertial sky.

If you have a look at the keplerian elements of a geo-stationary satellite you will see that the mean motion figure is about 1.0027. As Clarke said, this gives the satellite the same angular velocity as the Earth. Each geo-stationary satellite can "see" almost half the Earth; therefore three such satellites placed into orbit 120 degrees from each other will all be able to "see" each other around the Earth. Messages can therefore be relayed between them to cover almost the entire Earth. Almost, because they still miss a bit close to the poles.

A good example of this occurs at the Antarctic bases which are mostly located around the coast of the frozen continent, a distance from the South Pole. At these bases the INMARSAT dishes are virtually pointing at the horizon. Much further south and you could not use any geo-stationary satellite. They would be below your horizon.

Many satellites are in an orbit of the same radius as the Clarke Belt but their orbit is inclined. They pass through the Clarke Belt

twice every revolution. To a ground based observer they will not be stationary. They will trace out a short line or arc in the sky, sometimes a thin ellipse or "figure of eight". You can pick them from a kep element list by their mean motion figure of about 1.0027 and the fact that their inclination is NOT zero degrees. For stations at high latitudes they offer good communications with minimum tracking effort. These satellites are said to be geo-synchronous rather than geo-stationary.

As I said at the beginning, it is easy to confuse the two terms but they have quite different meanings. AMSAT's new flagship P3D will be in an orbit which brings it back over the same ground trace once every three revolutions. This is called a "Synchronous" orbit. Its period will ensure that the apogees will occur spaced 120 degrees of longitude apart so that after three orbits it will pass over the same (or close to the same) ground point. It will have three apogees in each 48 hours so every two days it will appear to be in the same part of the sky. It will not be stationary but will move, albeit more slowly, rather like AO-10 and AO-13. Some commercial satellites are placed into synchronous orbits to exploit similar orbital characteristics.

Radio Books for Australia

Shortwave Eavesdropper CD-ROM

Gives instant access to well over 32,000 frequencies and 42,000 callsigns listing military, tactical, ships - naval and merchant, embassies, aeronautical, press agencies, weather stations and countless more. Also in-depth country by country information containing QSL addresses, schedules, examples of traffic and maps. DX Edge

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Mid-year Amateur Radio Satellite Status Update

This year has seen the loss of MO-30, the possible loss of RS-10/11, and RS-15. Operations were suspended on MIR for some time as a result of a couple of nasty mishaps. Not a good start. Thankfully there have been no other major upheavals in the status of the OSCARS since January so I'll confine this report to an update of operations rather than an exhaustive list of frequencies/modes etc.

MM

Uplink 145.2 MHz FM, Downlink 145.8 MHz FM. Note, the above split is used for both packet and voice operation.

SAFEX, MIR 70 cm Repeater

Uplink 435.75 MHz FM, Downlink 437.95 MHz FM, sub-audible tone 141.3 Hz. Many reports have been received indicating that Astronaut Mike Foale KB5UAC has been quite active on two metre FM as ROMIR from the MIR space station. Neither the packet station nor the SAFEX module have been re-activated after the recent suspension of operations.

AO-10

Uplink 435.030-435.18 MHz CW/SSB, Downlink 145.975-145.825 MHz CW/SSB. AO-10 goes to sleep now and then as it is only being powered by the solar cells. At the time of writing it is going into eclipse and will be out of service for a few weeks at least.

RS-10/11

Uplink 145.865-145.905 MHz CW/SSB, Downlink 29.36-29.4 MHz CW/SSB. No signals, beacon or transponder have been reported for some weeks. We may have lost RS-10/11.

UO-11

Downlink 145.825 MHz FM, 1200 Baud PSK. Beacon 2401.500 MHz. Operating normally. Telemetry and bulletins only. This satellite does not have a transponder or user uplink of any sort.

RS-12/13

Uplink 21.21-21.25 MHz CW/SSB, Downlink 29.41-29.45 MHz or 145.91-145.95 MHz CW/SSB. RS-12/13 is operational.

RS-15

Uplink 145.858-145.898 MHz CW/SSB, Downlink 29.354-29.394 MHz CW/SSB. Be aware that RS-15 has battery charging problems, particularly when out of sunlight.

RS-16

RS-16 signals have not been heard for some time and it may not be operational. No word from the control station. It is still possible that the switch-off is part of the commissioning process.

AO-16 (PACSAT)

Uplink 145.9, 145.92, 145.94, 145.86 MHz FM, 1200 bps Manchester FSK. Downlink 437.0513 MHz SSB, 1200 bps RC-BPSK. Beacon 2401.1428 MHz.

DO-17 (DOVE)

Downlink 145.825 MHz FM, 1200 Baud AFSK. Beacon 2401.220 MHz. Work is continuing on reloading DOVE software after the recent crash. Dove has no user uplink or transponder.

WO-18 WEBERSAT

Downlink 437.104 MHz SSB, 1200 Baud PSK AX.25. Webersat is currently broadcasting telemetry only.

UO-19 LUSAT

Uplink 1200 bps Manchester encoded FSK. Uplinks: 145.84, 145.86, 145.88, 145.9 MHz FM, Downlink 437.125 MHz SSB, 1200 bps RC-BPSK.

FO-20

Uplink 145.9-146.0 MHz CW/LSB, Downlink 435.8-435.9 MHz CW/USB. Operating normally. Strong downlink signal.

UO-22

Uplink 145.9, 145.975 MHz FM, Downlink 435.12 MHz FM, 9600 Baud FSK. Operating normally, carrying mostly SatGate traffic as usual.

KO-23

Uplink 145.85, 145.9 MHz FM, Downlink 435.175 MHz FM, 9600 Baud FSK. KO-23 is operating normally, it has recovered from its recent QSY and over-deviation problems.

Club Corner

ANARS (Australian Naval Amateur Radio Society)

CQ CQ CQ all radio amateurs and interested SWLs who have a professional naval or marine background. ANARS offers you the opportunity to enjoy amateur radio activities in company with kindred souls of the sea.

Join one of our Navy Nets, QSO/QSL with the crew and/or DX.

Weekly Nets are: Mondays on 3532 kHz, 0930 UTC, CW mode; and Wednesdays on 3620 kHz, 0930 UTC, SSB mode.

Daily SSB Nets are: 7075 kHz, 0400 UTC (Net Control VK2SEA); and 14175 kHz, 0430 UTC, "The Seven Seas Net" (Net Control VK7SEA).

ANARS promotes various awards and publishes regular issues of QUA, the official Journal of the Society. Articles contributed by members include topical, historical,

KO-25

Uplink 145.980 MHz FM, Downlink 436.5 MHz FM, 9600 Baud FSK. KO-25 is operating normally. Lots of BBS traffic. Good signals.

IO-26 ITAMSAT

Uplink 145.875, 145.9, 145.925, 145.95 MHz FM. Downlink 435.822 MHz SSB, 1200 Baud PSK. IO-26 controllers report that the new ROBOT software is currently undergoing tests. They ask that ground stations please do not transmit on any of the satellite's uplink frequencies for the time being.

AO-27

Uplink 145.85 MHz FM, Downlink 436.792 MHz FM. This satellite is only switched to amateur service at weekends and only then in the northern hemisphere.

FO-29

Voice/CW Uplink 145.9-146.0 MHz CW/LSB, Downlink 435.8-435.9 MHz CW/USB. Digital Uplink 145.85, 145.87, 145.910 MHz FM, Downlink 435.910 MHz FM 9600 baud BPSK. As usual with the Fuji satellites it is difficult to get a hard and fast operating schedule.

New Surrey Satellites

No news to hand yet on these exciting new birds, perhaps next month.

*RMB 1627, Milawa VIC 3578
E-mail: yk3j@amsat.org

BR

technical and biographical items from home and abroad, along with general business items of the Society

For further information, please write to The Secretary ANARS, 13 Brothers Road Dundas, NSW 2117; or phone 02 9638 3569, or e-mail fayem@sydney.dialix.oz.au; or simply join one of our nets for a cordial welcome.

Our common bonds are the sea and radio.
Doug Charlton VK7DK

**Prevent pirates -
make sure you
sell your
transmitter to a
licensed amateur**

Awards

John Kelleher VK3DP - Federal Awards Manager*

It is really gratifying to note that, after the publication of a list of Australian awards, I have received information on three of those awards, verifying that they are still viable. These are the Wildcat Award, the Pelican Award, and a small group of RNARS sponsored awards, including the H M Colonial Ship Protector Award.

The Wildcat Award

This award, with its central motif of a marine oil rig, depicts the discovery of oil in Bass Strait, off the Gippsland coastline, during the 1960s, hence the name Wildcat. Set into each corner is a small picture displaying the four major industries of Gippsland, brown coal power generation, a large dairy industry, coastal fishing, and a coastline of magnificent beaches for the surfer and tourist traveller. The certificate is printed in two colours, blue and black, on a white background.

The Eastern Zone of the Wireless Institute of Australia (Victorian Division) has made this award available to DX operators. The aim is to promote DX activity, and interest in the Gippsland region of Australia.

The Award will be granted to any operator outside Australia who has made two-way contact with five stations resident in the Gippsland Zone on or after November 1967.

Contact with Gippsland stations operating portable or mobile within the Zone boundaries will be accepted.

Claims should be lodged with proof of log contacts, plus five IRCS to: Award Manager, David V Scott VK3DY, 174 Johnson Street, Maffra VIC 3860. Packet address is: VK3DY@VK3BVP.

This award is also available to VHF operators. Basic rules are the same, except that the distance between operator and claimant MUST be 50 miles or further. All contacts should have occurred on or after 1 November 1970.

The frequency in use must be 50 MHz or above using any mode, but excluding recognised repeater or net frequencies. Claimants should forward three stamps, together with proof of log, to the Award Manager, VK3DY.

Both awards are for two-way contact, and as such are not available to SWLs.

The Pelican Award

This award is sponsored by The Sunshine Coast Amateur Radio Club Inc which conducts a net each Thursday night commencing at 0900 UTC on 3.595 MHz, to encourage participation in the award.

1. The award is available to licensed amateurs and SWLs.

2. Contacts on or after 1 July 1980 are valid.

3. The award may be issued for contacts using all bands and modes, including contacts via repeaters during tropospheric ducting.

4. Stations in Australia require 10 certified contacts with different members of the Sunshine Coast Amateur Radio Club. All other stations require five certified contacts. The Club Station VK4WIS counts as two contacts.

5. All contacts are to be made from the same location. The "same location" being taken to mean within a radius of 240 km (150 miles) of the original location.

6. A list showing full details of contacts should be certified by two licensed amateurs. QSL cards not required.

7. The fee for the award is \$AUS2.00 or one IRC.

8. Address applications to: The Awards Manager, Sunshine Coast Amateur Radio Club Inc, PO Box 80, Nambour QLD 4560.

South Australian Group of the RNARS

The following information arrived by mail from the South Australian Group of the Royal Naval Amateur Radio Society (RNARS), sent by their Secretary, Eric Leach. He states that, in addition to the Awards issued under the control of other Branches of the RNARS, the South Australian Group control:

1. The H M Colonial Ship Protector Award. The Custodian is Jack Peatfield VK5AF, 1 Filmer Avenue, Glengowrie SA 5044. The fee is \$AUS5.00 or seven IRCS.

2. The H M Bark Endeavour Award. The Custodian is Eric Leach VK5AFN, 37 Hallett Avenue, Tranmere SA 5073. The fee is also \$AUS5.00 or seven IRCS.

Rules for these two awards were not readily available at the time of printing, so interested parties may feel free to drop a line to Eric Leach at the above address.

The W3USS Award

Make one contact with W3USS, the club station of the Capitol Hill ARS, whose QTH is in the historic Russell Senate Office Building, GCR list and a fee of \$US1.00 or four IRCS to: Certificate US Senate, Box 73, Washington DC 20510, USA.

The El Paso Award

Contact 15 El Paso, Texas stations on any band or mode. No time limitations. No charge, but suggest you send postage, and GCR list, including the name of the operators you worked, to: El Paso ARC, 2100 San Diego Avenue, El Paso TX 79930, USA.

*4 Brook Crescent, Box Hill South, VIC 3128
Phone (03) 9809 8593

The Wildcat Award. The original certificate is in blue, black and white, and measures 264 mm wide by 210 mm.

Contests

Peter Nesbit VK3APN - Federal Contest Coordinator*

Contest Calendar

July – September 1997

Jul 1	Canada Day CW/Phone	(June 97)
Jul 5	Australasian Sprint (CW)	(June 97)
Jul 5	Jack Files Memorial Contest (CW)	(June 97)
Jul 5	NZART Memorial Contest (Phone/CW)	(June 97)
Jul 12	Australasian Sprint (Phone)	(June 97)
Jul 12	Jack Files Memorial Contest (Phone)	(June 97)
Jul 12/13	IARU HF Championship	(June 97)
Jul 19	South Pacific 160 m Contest	(June 97)
Jul 19	Colombian DX Contest (Phone/CW)	(June 97)
Jul 26	Waitakere 80 m Phone Sprint	(June 97)
Jul 26/27	RSGB IOTA Contest	(June 97)
Aug 2	Waitakere 80 m CW Sprint	(June 97)
Aug 2/3	YO DX Contest	
Aug 9/10	Worked All Europe CW	
Aug 16/17	Remembrance Day Contest	
Aug 16/17	Keyman's Club of Japan (CW)	
Sep 6/7	All Asia DX Contest Phone	(May 97)
Sep 6/7	Bulgarian DX Contest	
Sep 13/14	Worked All Europe Phone	
Sep 20/21	SAC DX CW	
Sep 27/28	SAC DX Phone	
Sep 27/28	CQ WW RTTY DX Contest	

A friend came to visit from interstate recently and, as we discussed old times, we realised how many years had passed since our first meeting.

The year was 1964, and we were both 15, introduced by a mutual friend at the old WIA rooms in East Melbourne. As part of a larger group of half a dozen or so other teenagers, we were full of enthusiasm for our hobby, and spent most of our spare time tinkering with an assortment of home made transmitters and receivers, in between pedalling our push bikes between our respective houses.

As our major source of components was old radios, it was no surprise that our transmitters often comprised 6J7 or 6BQ5 oscillators, and 6V6GT or 6BM8 power amplifiers. As time went by, we experimented with various other tubes, eventually graduating to what we thought was the ultimate in "high power", ie the venerable 807, and other less conventional devices.

One of the weirdest was a PT15, obtained from a surplus WW2 radar exciter by a friend. This tube was reputed to be even more powerful than an 807, but was notoriously unstable. However, this made my friend's signals very easy to find, as all one had to do was tune across the band in the direction of greatest noise, in the middle of which he

could be heard muttering oaths like "damn PT15... bloody oscillating again!" Then one day, without warning, he appeared with a much weaker signal, but clean at last. He explained to me that the PT15 had "acted stupid just once too often", so he had put it out of its misery with a brick. My feelings of relief were mixed with disappointment, because I had long admired the enormous signal put out by that tube, even if it did sound like the arrival of the Tardis from Dr Who.

As a student, I was lucky enough to have a part-time job at the well-known Melbourne electronics retailer J H Magnath & Co. That company is, unfortunately, long gone, but during the sixties it was THE meeting place for anyone and everyone interested in electronics on Saturday mornings. Some days there were over a hundred customers in the store, all at the same time, and it was almost impossible to cross the floor between the counters. Many were the times that after shutting the doors at midday, we would still be clearing customers an hour and a half later.

As a keen home brewer and amateur, I developed a good eye for what people were building according to the parts they bought, and would often startle them by making some casual remark about what they were building. "How did you know that?" they would stammer, worried what other deep secrets I

might be privy to, not realising that their project was blindingly obvious from the parts in their self-service tray.

This developed into a rather fiendish game. Occasionally a young customer would wander around collecting things like a 9" by 6" chassis, a crystal socket, one or two five pin ceramic sockets, large top caps, etc. After coming to the counter they would nervously look around, and in hushed tones ask about ceramic switches or Airdux coil stock, as if they were buying certain items from a chemist's shop. This was my cue. "Ahem", I would say, doing my best to look official, "the Postmaster General's Department has asked us to be on the lookout for people building unlicensed transmitters. You DO have a licence for the equipment you're building, don't you Sir?"

Their jaws would drop and faces go red, and eventually they would blurt out "Of course! Of course!" I was never able to hold a straight face for long, however, and after a good laugh and obvious relief from my victims, many good friendships were made from these and other encounters in that wonderful place.

Many thanks this month to VK6APK, DL2DN, JA1DD, and 9V1YC Until next month, good contesting!

73, Peter VK3APN

Worked All Europe DX Contest

9/10 August (CW), 13/14 September (SSB), 8/9 November (RTTY); 0000z Sat – 2400z Sun.

The object is to work European stations (except in the RTTY section, where anyone works anyone). Bands are 80-10 m. In the contest, avoid 3550-3800 and 14060-14350 kHz on CW, and 3650-3700, 14100-14125 and 14300-14350 kHz on SSB. The minimum time of operation on a band is 15 minutes, although bands may be changed within this period, if and only if, the station worked is a new multiplier. Categories are single operator all bands; multi-operator single transmitter; and SWL all bands. DX cluster support is allowed. A maximum of 36 hrs is allowed for single operator stations, with up to three rest periods (mark them in the log).

Exchange RST plus serial number. Additional points can be gained reporting QTCs, as follows: after working a number of European stations, details of those previous QSOs (ie QTCs) can be reported during a current QSO with a European station. In the CW and phone sections, QTCs are sent from non-European stations to European stations. In the RTTY section, QTCs can be sent to any station, including non-Europeans, outside one's own WAC continent. A QTC contains the time, callsign, and QSO number of the

station being reported, eg: "1307/DA1AA/431" means you worked DA1AA at 1307z and received serial number 431. Commence QTC traffic by sending the QTC series and number of QSOs to be reported, eg "QTC 3/7" indicates this is the third series and that seven QSOs will be reported. A QSO may be reported only once, and not back to the originating station. A maximum of 10 QTCs can be sent to the one station, who can be worked more than once to complete the quota. Only the original QSO, however, will have points value.

The multiplier on each band equals the number of European countries worked on that band (or on RTTY only, the number of DXCC/WAE countries), times a band factor. The band factors are four for 80 m, three for 40 m, and two for 20/15/10 m. Add the band multipliers together, and multiply by the sum of (QSOs + QTCs) to obtain the final score.

SWLs may log each station heard, European and non-European, once per band. Logs must contain both callsigns and at least one of the control numbers. Count one point for each station logged, and one point for each complete QTC received (max 10 per station). It is possible to claim up to two multipliers per logged QSO.

Use standard log and summary sheet format. Include a checklist for more than 100 QSOs on any band and, if more than 100 QTCs have been sent, include another checklist to show that the quota of 10 QTCs per station is not exceeded. Logs can be submitted in ASCII on DOS disk, providing a paper summary sheet is included. Send logs to: WAEC Contest Committee, Box 1126, D-74370 Sersheim, Germany. Deadlines are 15 Sept (CW), 15 Oct (SSB), and 15 Dec (RTTY). Comprehensive awards are offered.

European countries are: C3 CT1 CU DL EA EA6 EI EM/N/O ER ES EU/V/W F G GD GI GJ GM GM (Shetland) GU GW HA HB HBO HV I IS IT JW (Bear) JW (Spitzbergen) JX LA LX LY LZ OH OH OH OJO OK/L OM ON OY OZ PA RI/FJL R1/MDV R/U (Russia) RA2 SS SM SP SV SV5 (Rhodes) SV9 (Crete) SV (Mt Athos) T7 T9 TA1 TFTK UR-UZ (Ukraine) YL YO YU Z3 ZA ZB2 1A0 3A 4U (Geneva) 4U (Vienna) 9A 9H.

Keyman's Club of Japan (CW)

16/17 August, 1200z Sat - 1200z Sun.

This contest is designed for CW enthusiasts, and will particularly suit those who are collecting Japanese prefectures for awards. The only category is single operator multi-band. Suggested frequencies are 1908-1912 (split), 3510-3525, 7010-7030, 14050-14090, 21050-21090, and 28050-28090 kHz. Exchange RST plus continent code (OC). JAs will send RST plus district code.

Score one point per QSO. The multiplier on each band is the total number of JA districts (max 62 per band). Final score equals total points x total multiplier. Show duplicate QSOs with zero points, attach a summary sheet showing all usual information, and send the log to: Yasuo Taneda JA1DD, 279-233 Mori, Sambu Town, Sambu, Chiba 289-12, Japan, postmarked no later than 17 September 1997. ASCII logs on DOS disk are most welcome. I have complete rules and district codes (SASE please).

1997 REMEMBRANCE DAY CONTEST

Presented by Alek Petkovic, VK6APK

I take pleasure in presenting the rules for this year's contest. The rules are unchanged from last year, except for the addition of a multi-operator category, in response to requests from several people following last year's contest. This means that single operator entrants need no longer feel overshadowed by the large multi-operator stations, which often amass very large scores and can be very difficult to beat, as they will now have a much better chance to obtain a certificate and receive due recognition for their efforts in the results.

I have also clarified the wording of the rules in a couple of places, and added a step by step description of the determination of the winning Division (taken from the results published last December). These changes do not affect the contest.

I would like to wish everyone a most enjoyable event, and look forward to seeing you all in it. Good luck!

Purpose: This contest commemorates the amateurs who died during WWII, and is designed to encourage friendly participation and help improve the operating skills of participants. It is held annually on the weekend where the Saturday is closest to 15 August, the date when hostilities ceased in the south-west Pacific area.

It is preceded by a short opening address by a notable personality, transmitted on various WIA frequencies during the 15 minutes immediately before the contest. During this ceremony, a roll call of those amateurs who paid the Supreme Sacrifice is read.

A perpetual trophy is awarded annually to the WIA division with the best performance. It is inscribed with the names of those Australian amateurs who made the Supreme Sacrifice, to perpetuate their memory throughout amateur radio in Australia.

The name of the winning Division each year is also inscribed on the trophy, which is presented at the Annual Federal Convention. The winning Division holds the trophy for the following 12 months, and receives a

certificate. The leading entrants will also receive certificates.

Objective: Amateurs in each VK call area will endeavour to contact other amateurs in other VK call areas, P2 and ZL, on 1.8-30 MHz (10, 18 and 24 MHz excluded). On 50 MHz and above, amateurs may also contact other amateurs in their own call area.

Contest Period: 0800 UTC Saturday, 16 August to 0759 UTC Sunday, 17 August 1997. As a mark of respect, stations are requested to observe 15 minutes silence prior to the start of the contest, during which the opening ceremony will be broadcast.

Rules:

1. The contest categories are:
 - (a) High Frequency (HF) - for operation on bands below 50 MHz;
 - (b) Very High Frequency (VHF) - for operation on the 50 MHz band and above.
2. Within each category the applicable sections are:
 - (a) Transmitting Phone (AM, FM, SSB, TV);
 - (b) Transmitting CW (CW, RTTY, AMTOR, PACTOR, packet, etc);
 - (c) Transmitting Open (a) and (b);
 - (d) Receiving (a), (b) or (c)
3. All amateurs in Australia, Papua New Guinea and New Zealand may enter the contest, whether their stations are fixed, portable or mobile.
4. Cross mode and cross band contacts are not permitted.
5. Call "CQ RD", "CQ CONTEST", or "CQ TEST".
6. On bands up to 30 MHz, stations may be contacted once per band using each mode, ie up to twice per band using Phone and CW.
7. On the 50 MHz band and above, the same station in any call area may be worked using any of the modes listed at intervals of not less than two hours since the previous contact on that band and mode.
8. Both single and multi-operator entries are permitted. To be eligible as a single operator, one person must perform all operating and logging activities, without assistance, using his or her own callsign. More than one person can use the same station and remain a single operator, providing that each uses his or her own callsign, submits a separate log under that callsign, and does not receive operating or logging assistance from anyone else during the contest.
9. Multi-operator (club) stations may be operated by any number of people, but only one person may operate at any time, ie no multi-transmission.
10. For a contact to be valid, numbers must be exchanged between the stations making

the contact. The number will comprise RS (for phone) or RST (for CW), followed by three figures commencing at 001 for the first contact, and incrementing by one for each successive contact.

11 Contacts via repeater (including satellite) are not permitted for scoring purposes. Contacts may be arranged through a repeater. The practice of operating on repeater frequencies in simplex is not permitted.

12 On all bands, except 160 m, score one point per completed valid contact, and on 160 m, score two points per completed valid contact. On CW, score double points.

13 Logs should be in the format shown below, and accompanied by a summary sheet showing the following information:

Callsign;
Name;
Address;
Category (HF or VHF);
Section (Phone, CW, Open, or Receiving);
For multi-operator stations, a list of the operators;

Total score;

Declaration: "I hereby certify that I have operated in accordance with the rules and spirit of the contest."

Signed. Date:

14 Entrants operating on both HF and VHF are requested to submit separate logs and summary sheets for HF and VHF.

15 VK entrants temporarily operating outside their allocated call area, including those outside continental Australia as defined for DXCC, can elect to have their points credited to their home Division by making a statement to that effect on their summary sheet.

16 Forward the log/s and summary sheet to: RD Contest Co-ordinator, A Petkovic VK6APK, 26 Freeman Way, Marluu, WA 6020. Endorse the envelope "Remembrance Day Contest" on the front outside. Entries must be forwarded in time to reach the Contest Co-ordinator by Friday, 19 September 1997.

17 Certificates will be awarded to the leading entrants in each section, both single and multi-operator, in each Division, P2, and ZL. Entrants must make at least 10 contacts to be eligible for awards, unless otherwise decided by the Contest Co-ordinator.

18 Any station observed as departing from the generally accepted codes of operating ethics may be disqualified.

Determination of Winning Division: Unless otherwise elected by the entrant concerned, the scores of VK0 stations will be credited to VK7, and the scores of VK9 stations will be credited to the mainland VK call area which is geographically closest. The

scores of P2, ZL, and SWL stations will not be included in these calculations.

For each Division, an "improvement factor" will be calculated as follows:

(a) For transmitting logs only, HF and VHF "benchmarks" for each Division will be established, against which its performance for the current year is judged. The same formula will be used for HF and VHF, inserting the HF or VHF figures as appropriate:

$$B = 0.25 P + 0.75 L$$

where B = this year's benchmark, P = last year's total points, and L = last year's benchmark.

(b) For each Division, HF and VHF Improvement Factors will then be calculated. Once again, the same formula will be used for HF and VHF, inserting the HF or VHF figures as appropriate:

$$I/F = \text{Total points (this year)}/\text{Benchmark}$$

where I/F = improvement factor.

(c) For each Division, the HF and VHF Improvement Factors will then be averaged. Overall I/F = (HF I/F + VHF I/F)/2

(d) The Division which achieves the highest overall Improvement Factor will be declared the winner.

1997 Benchmarks

These are the total scores which must be obtained, by each Division, to improve on its results for the previous year:

Div	HF	VHF
VK1	813	260
VK2	4347	74
VK3	4413	11695
VK4	3283	1181
VK5/8	3746	1352
VK6	2959	7078
VK7	1927	190

Receiving Section Rules

1. This section is open to all SWLs in Australia, Papua New Guinea, and New Zealand. No active transmitting station may enter this section.

2. Rules are the same as for the Transmitting Section, as applicable.

3. Only completed contacts may be logged, ie it is not permissible to log a station calling CQ. The details shown in the example must be recorded.

4. The log should be in the format shown below

Example Summary Sheet

Remembrance Day Contest 1997

Callsign: VK1XXX

Name: Joe E Brown

Address: PO Box 123, Farm Orchard,
ACT 2611

Category: HF

Section: Transmitting phone

Total Score: 515

Declaration: I hereby certify that I have operated in accordance with the rules and spirit of the contest

Signed: J E Brown Date: 23/8/97

Example Transmitting Log

Remembrance Day Contest 1997

Callsign: VK1XXX

Category: HF

Section: Transmitting phone

Date	Band	Mode	Call	No	No	Pts
Time (MHz)				Sent	Recv	

0801	14	SSB	VK2QQ	58001	59002	1
0802	14	SSB	VK6LL	59002	59001	1
0806	14	SSB	VKSANW	59003	58011	1
0808	14	SSB	ZL2AGQ	56004	57004	1
0811	7	SSB	VK4XX	59005	59008	1

Example Receiving Log

Remembrance Day Contest 1997

Name/SWL No: L30371

Category: HF

Section: Receiving phone

Date	Band	Mode	Calling	Calling	No	No	Pts
Time (MHz)					Sent	Recv	

0801	14	SSB	VK1XXX	VK2QQ	58001	59002	1
0802	14	SSB	VK1XXX	VK6LL	59002	59001	1
0805	14	SSB	VKSANW	VK1XXX	58011	59003	1
0807	14	SSB	ZL2AGQ	VK1XXX	57004	56004	1
0809	14	SSB	VK7AL	VK2PS	59007	58010	1

Results of Asia-Pacific Sprints

(* T-Shirt winner)

1st Sprint (16 July 1995):

VK5GN 23 x 17 391

2nd Sprint (30 Sept 1995):

VK5GN* 40 x 33 1320

VK4TT 34 x 29 986

VK1FF 20 x 19 380

(op. WB2FFY)

3rd Sprint (24 March 1996):

VK4EMM* 34 x 29 986

4th Sprint (8 June 1996):

VK1FF* 34 x 27 918

VK2AYD 24 x 21 504

VK4TT 14 x 18 324

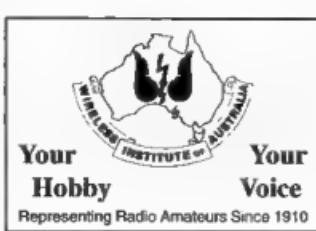
5th Sprint (19 October 1996):

VK5GN* 32 x 27 864

6th Sprint (8 Feb 1997):

No VK entrants

*PO Box 2175, Castlemaine Junction, VIC 3475
pneab@mechpc.org.au



Divisional Notes

Forward Bias - VK1 Notes

Hugh Blemlings VK1YYZ

A s pre-empted in last month's *Forward Bias*, the Division's web site is now online. You can point your browser at <http://www.vk1.wia.ampr.org> for more details. Incidentally, if you have had some experience in web page design and would like to contribute to the Division's site, please drop me a line at president@vk1.wia.ampr.org.

New Contact Details

Our Divisional e-mail addresses are now operational. You can contact the committee as a whole by sending mail to committee@vk1.wia.ampr.org. Broadcast items can now be sent to broadcast@vk1.wia.ampr.org. We have also set up addresses for individual office holders such as Secretary, Treasurer, QSL, etc. A complete list is available on the web site.

On a quieter note, it is with regret that we note the passing of a friend and long time member of the WIA, Don Hume VK1DH after a long illness. Don's contributions to amateur radio were many and he will be missed by all. Don's obituary will appear in next month's *Amateur Radio*.

Coming Events

By the time you read this, the fox will have been hunted and junk bought and sold, as a Foxhunt and Buy-and-Sell night round out the June activities for the Division.

Looking to July's general meeting, we will have Dr Rod Boswell from the ANU's Research School of Physical Sciences and Engineering as a guest speaker. Dr Boswell has worked in a wide range of areas within the physical sciences, most recently in Plasma Physics. His background extends into such diverse areas as radio propagation, space-borne antenna systems and semiconductor fabrication. He has declared his intention to talk about things of interest to the audience rather than things that are not, so this will be an evening not to be missed!

August will see the presentation on packet radio and the Division's soon-to-be-installed bit regenerative repeater which has been held over from July. Again, details will be available on our web site.

Look forward to seeing you at the next meeting!

VK2 Notes

David Thompson VK2NH

W ell, here we are in a new financial year and most of the Board of Directors from last year have been returned to office in the annual elections. However, there are

some new faces and these are Owen Holmwood VK2AEJ, Pat Leeper VK2JPA and David Thompson VK2NH.

Our new President is Geoff McGrorey-Clark VK2EO. There was one resignation, that of Peter Jensen VK2AQJ, last year's Divisional President. Thank you, Peter, for your work in your position with the executive.

There have been many tasks handed out to the Councillors. These include planning for the Year 2000 Olympics and the role amateur radio will take in that, Public Relations for the organisation, and representation of the VK2 Division at a Federal level, among many other roles essential to the running of the Division. We in the New South Wales Division are looking forward to building on the successes of the past year and positively facing the challenges in the lead-up to the Year 2000 Olympics. However, we can only achieve by a partnership existing between all of us as members of the Division. We need your input to make this great hobby even better.

The VK2 Council, with some designated portfolios, is: Geoff McGrorey-Clark VK2EO, President, Alternate Federal Councillor, NTAC Chairman, and QSL Bureau Co-ordinator; Michael Corbin VK2YC, Vice President, Federal Councillor, Deceased Estates, and Regional Representative (South); Brian Kelly VK2WBK, Vice President, Education (Country), and Regional Representative (North); Eric Fossey VK2EFY, Secretary, Membership, Administration, Bookshop, Parramatta Property, and Alternate Federal Councillor; Eric van de Weyer VK2KUR, Treasurer, and Security; Ken Westerman VK2AGW, Affiliated Clubs, and Regional Representative (West and Riverina); Pat Leeper VK2JPA, Trash and Treasure, and Education (City); Owen Holmwood VK2AEJ, Dural Officer, and Chairman Policy and Strategy Committee; and David Thompson VK2NH, Olympic Games Year 2000, and Public Relations.

Affiliated Clubs Officer Ken Westerman VK2AGW reports that the Conference of Affiliated Clubs held on Saturday, 10 May 1997 was a great success. Many club delegates and Councillors have reported that they enjoyed the day at which many new friends were made. A lot of enthusiasm was projected in plans to highlight the aims and interests of the hobby and the interests of members of the Wireless Institute VK2 Division. Thanks to those who have already fed back to the executive on the conference.

We need to hear your views to know how to serve you best.

Ken VK2AGW is doing a great job with the affiliated clubs. It is essential that we foster the interests of members all over New South Wales. This is the reason we have assigned Councillors to cover specific areas of the state which, for the purpose, has been divided into North, South and West regions. Those Councillors are nominated above.

Last month the VK2 Division marked 40 years at Dural. This length of time broadcasting from one location is a great achievement, deserving special recognition of the broadcast teams, past and present, who have given so much to keeping the site up-to-par.

As you know, the VK2 Division brings you its weekly news broadcast at various times and on numerous frequencies. A new frequency has been added, one which will no doubt become increasingly popular, both domestically and overseas, as the sunspot cycle progresses. You will now find the Divisional broadcast on 20 metres on the nominal frequency of 14.160 MHz. All the other frequencies for the broadcast are found on page 56 of this publication.

If you would like to contact the VK2 Division regarding your hobby, please do not hesitate to contact the office or any of the Councillors. We will be only too pleased to hear from you. If you would like to get in touch with an individual Councillor, just contact our Divisional office and it will be arranged. Our freecall phone number is 1800 817 644 and our address can be found on page 56.

In ending the VK2 notes for this month, a big vote of thanks goes to our Office person, Pixie Chappell VK2KPC. Thanks, Pixie! everything goes much more smoothly with you at the helm.

Next month we'll have more to report but, if you have anything you would like us to include as VK2 news, send it to me at PO Box 82, Springwood or by e-mail to dthom@penrithcity.nsw.gov.au

VK3 Notes

Jim Linton VK3PC

WIA Victoria AGM

T he Annual General Meeting was held on 28 May. There were no Motions on Notice, and the official business consisted of the election of Councillors and the appointment of Auditors.

The Council remains unchanged, however, it has been reduced in numbers by two in accord with the new Articles of Association. Serving Councillors are Jim Linton VK3PC, Barry Wilton VK3XV, Rob Hailey VK3NC, Bill Trigg VK3JTW, George Hunt VK3ZNE, Peter Mill VK3APO, Jerry

Viscaal VK3MQ, and Steve Bushell VK3HK. Messrs Barnard Baudinette & Co Pty Ltd were re-appointed as Auditors.

The new Council, at its inaugural meeting on 3 June, re-appointed the Secretary, Barry Wilton VK3XV, and President, Jim Linton VK3PC. Bill Trigg VK3JTW was appointed Vice President. The Treasurer, Rob Hailey VK3NC, was re-appointed last December with that office's term aligned to WIA Victoria's financial year which ends on 31 December.

Among the topics discussed by the 1997/98 Council were financial matters, particularly those in the WIA Federal arena, changes in repeater and beacon licensing fees, the future of the VK3BWI broadcast, the 80 metre DX window submission, membership services and recruitment.

The Council faces an enormous challenge in the next three years due to a number of factors, including a slump in exam candidate numbers and new licensees.

Articles of Association

The revised Memorandum and Articles of Association for the WIA Victorian Division have been approved by the Australian Securities Commission. A copy will be posted to all members who attended the Special General Meeting which endorsed the new M&As for submission to the ASC, and those who provided input to their revision. They will also be provided to all new members joining WIA Victoria.

Current members who require a copy will be able to obtain one from the WIA Victoria office, or by post if a SASE is provided.

Federal Affairs

The WIA Victorian Council is reviewing the position of our Company and its ongoing relationship with the WIA Federal body, with a view to providing a number of member services which are currently undertaken by the Federal Office.

Whilst we believe it is necessary to support the Federation of the WIA in the best interests of the hobby, the Directors of the WIA Victorian Division are required to act at all times with "due care and diligence" in the financial management of WIA Victoria.

WIA Victoria considers it to be in the best interest of the hobby and our members for Victoria to continue to provide financial support for a number of important functions undertaken by the Federal body – specifically, International representation, IARU representation, SMA Liaison, and the publication of Amateur Radio magazine. We are not prepared to contribute membership funds for excessive expenditure over which we have no apparent control.

A number of alternatives are being

investigated and financially analysed, and will be discussed with our auditors. Members will be kept advised.

Turbo Tutorial

WIA Victoria is considering running another of its highly successful Turbo Tutorials, an intensive weekend AOCP theory bridging course. These are designed to help Novice licensees to increase their theory knowledge to the AOCP level, so they can upgrade.

If you would like to benefit from a Turbo Tutorial, please register your interest immediately with the WIA Victoria office. If there's sufficient demand the specialised theory weekend will be confirmed.

VK5 Notes

Ian Hunt VK5QX

Interview with Graham Kemp VK4BB for VK6 Division Broadcast

Recently I was interviewed by Graham VK4BB for a segment of the Queensland Divisional News Broadcast. He asked me two questions. The first was roughly "What are you doing in VK5 to facilitate the running of the Division?" The second was "What can the members and non-members do to help?" My answers were as follows:

"Well, Graham, in answering your first question I would like to comment that, although we live in an ever changing world, I believe at least two things should remain constant. These are honesty and integrity in our dealings with each other. They seem to be lacking in a major way in our society."

"Here in the VK5/VK8 Division the Council sees it necessary that our actions must be seen as being for the good of amateur radio in general and the members in particular. Our aim is to gain the respect and trust of the members. We know that this is something which does not come automatically and that we must earn this respect and trust."

"The Council is a Council of consensus and this consensus includes the membership. The approach is to include them as part of the

decision-making process and to involve them in as many issues as possible. This means that policy will be decided on the basis of the opinions expressed by the members. It also means that members will feel that they do play a part in the running of their own organisation."

"It is hoped that, as a result, members will come to take an even greater interest and become more involved in what is going on."

"The Council also actively encourages the members to keep a watchful eye on what is done and to correct us if they feel that we are not following the right path. In this way we feel that the best interests of all will be served."

"In talking with the members of the Divisional Council recently, I suggested to them that one thing that turns people away from full participation is a situation where their views and opinions cannot be expressed or are suppressed. It is a well known fact that, even at the highest levels of law in our country, a minority judgement on a matter can be published."

"Thus, even where the Divisional Council has come to a decision on a matter, a member of Council or any other member must still be free to make their feelings known should they disagree with a particular point. In that way a healthy discussion can still ensue in providing a balance and check on our actions."

"In answer to your second question, in the matter of involvement of members and non-members, an approach based on what I have just said is most desirable."

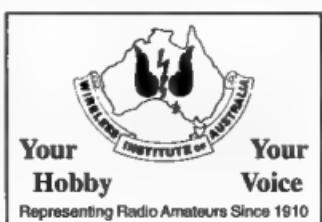
"I must comment that we actively encourage the participation of members in the running of the Division. But we need to know what the members feel and think regarding the things that should be done to further the cause of amateur radio."

"Ensuring that the opinions of members are respected goes a long way to increasing their desire to participate and help in Divisional activities. As well as expressing their opinions, members will hopefully come to realise that practical support is also needed."

"Attendance at meetings is just one way in which they can help. Being prepared to participate by taking on tasks which need to be assigned such as arranging programs and events, maintaining of physical and other facilities for amateur radio purposes, being willing to serve on the Council and other committees, all play a part in the better running of our organisation."

"Much the same can also be said about non-members of the WIA."

"The Wireless Institute of Australia is the only organisation which is officially recognised by the authorities, be they State or



Federal or even International bodies, as representing amateur radio in Australia.

"This being the case, we must also find out as far as possible what others, and that includes non-member amateur radio operators, think about matters and issues which affect amateur radio in this country.

"I suggest that, to this end, non-members should look closely at the WIA and see what it does. They should let us know how they feel about things and we should, at the very least, take note of whatever knowledge and understanding we can gain from them.

"In doing this, non-members should also consider where they stand and think seriously about contributing where they see things being done for the benefit of amateur radio as a whole, by supporting the things that the Institute does.

"It is a fact that many services are provided as a result of WIA activities. It is also true that, irrespective of membership, the actions of the WIA affect every amateur radio operator in the country. This fact needs to be kept in mind by all, particularly the officers of the WIA.

"I hope, Graham, that these thoughts give you some insight into the approach being adopted here in the VK5/VK8 Division and I wish the VK4 Division well in its efforts to contribute to the cause of amateur radio."

Perhaps this material will assist readers towards an understanding as to how the VK5 Divisional Council views the running of the DIVISION

Contact information for the VK5/VK8 Division is: President, Ian Hunt VK5QX, 8 Dexter Drive, Salisbury East 5109, tel 08 8250 1708; Secretary, Graham Wiseman VK5EU, 19 Washington Street, Hilton 5033, tel 08 8443 7273, and Treasurer, Joe Burford VK5UJ, 7 Trevilla Road Humbug Scrub 5114, tel 08 8280 7555

Apology

Recently we announced the passing of Don Wilton VK5KDW who had been a member of Council and held the portfolio of Education and Examinations. Due to an unfortunate oversight, his name was listed in the June issue of the Divisional Journal as still holding that position. The Journal Editor and President offer their apologies for this incorrect information.

Matters concerning Examinations should be directed to Tony Van Lysdonk VK5WC, 37 Gum Crescent, Gawler West 5118, tel 08 8522 4218

Correspondence

Sometimes correspondence can go astray. We received mail from a very large national business organisation which could be expected to run business vehicles, many of them fitted with two-way radio

communications equipment. The mail was addressed to the Spectrum Management Agency but was marked with our Box Number, 1234 GPO Adelaide. It was a tempting proposition to open the mail with the likelihood of it containing a large cheque for licensing radio installations in the fleet of vehicles. Perhaps we then could have forwarded the mail to the SMA with a request for a large handling commission fee! We resisted the temptation and re-addressed it unopened!

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

We are now in mid winter and most activity is naturally indoors. This means that many are probably engaged in projects in the shack, ready for the warmer months. Activity on VHF also seems to drop off mid year and I would expect that this, too, will be back to normal in summer.

Members of the Northern Branch have been recently considering the future of the Mount Barrow two metre repeater (VK7RAA) after a bill was received from Air Services Australia for site fees. There has been quite a deal of discussion as to its future viability as the amount of use on 147.000 MHz has markedly decreased. Many days the repeater is quite silent, with little or no activity, which is in contrast with what it was five years back. We apparently will be receiving quarterly accounts, so the Branch will be constantly reviewing various options. The majority of repeater activity is now on VK7RAB on 70 cm but, as this is solar powered, activity is restricted at this time of year to daylight hours. VK7RAB is linked to VK7RAF in Hobart and VK7RNE at Tower Hill, Fingal.

The Northern Branch has also been rationalising their financial outlays since the bill for site fees has come in and has decided to dispense with several calls when next they become due next year. These include VK7NB, the club callsign, which has not been used since a JOTA activity a few years ago. The Packet BBS callsigns will also probably revert to the current SYSOP. Also, the Branch has decided to clean out the

equipment cupboard and several items were recently put out to tender.

The Divisional President, Ron Churcher VK7RN, paid a visit to the Northern Branch in May and encouraged the Branch members to unite and work together. Recent developments have made it imperative for amateurs to work together as our hobby is constantly under threat. He also reported on the recent Federal Convention. After the meeting, Ron showed a video of his tour of Europe and Canada in 1996 including the famous Radio Museum in Guelph, Ontario. Sadly, since that video was made this historic collection had to be dismantled and placed in storage until they could find a new location. Ron is hoping to show this video later this year to the Southern Branch and it is well worth seeing.

The Divisional Awards officer is now John Bates VK7RT in Hobart. He has proposed some new awards and is wanting comments on the Awards structure to put in a submission to Divisional Council. The proposed awards are for the following planned Special Events: (a) Tall Ships 1998; (b) Sydney to Hobart yacht race; (c) Melbourne to Hobart yacht race; (d) Targa Tasmania; and (e) Southern Safari.

Also, he is considering updating the existing awards, namely the famous Tasmanian Devil Award and the Tassie Trout Award, as well as a proposed "Worked All VK7 Division Award". If you have comments or suggestions, please contact John as soon as possible at: John W Bates VK7RT, PO Box 151, Rosny Park TAS 7018; or by e-mail to batesjw@southcom.com.au

Meetings for this month are: Southern Branch on Wednesday, 2 July at 2000 hrs at the Domain Activity Centre, Hobart; North-western Branch on Tuesday, 8 July at 1945 hrs at the Penguin High School, Dial Road, Penguin; and Northern Branch on Wednesday, 9 July at 1930 hrs at the Launceston Institute of TAFE, Alanvale Campus Block "C".

Also note that there will be a meeting of Divisional Council on 19 July with the North-western Branch hosting. The actual venue will be given over the Divisional broadcast before the meeting. All Divisional members are welcome to come and observe.

Are you reading someone else's Amateur Radio? Call 03 9528 5962 to find out how to get it every month!

How's DX

Stephen Pail VK2PS*

Some time ago I was looking through old copies of *Amateur Radio*. My attention was drawn to an article written by Don Hopper VK7NN in the May 1996 issue of the magazine, in which he details his past experiences and activities as a volunteer with the Marine Rescue Co-ordination Centre in Canberra, handling maritime mobile emergencies.

Such an emergency became a reality for the participants of the ANZA Net on 19 May. One of the amateur operators on the Russian Antarctic Base Mirny had called in, advising the net controller that a Russian Yacht near the Kerguelen Islands had lost its rudder and required assistance. The whole net became a hive of activity and finally the message was relayed to the rescue authorities in Canberra.

I followed the fate of this yacht for a number of days. There were 12 people aboard and the yacht was drifting slowly in a north-easterly direction at a speed of about 2 1/2 knots. The yacht radio and aerials were tuned to several amateur radio frequencies of which 14182.50 kHz was used most of the time at 0600 UTC between the yacht and Perth Coastal radio. At one stage the rudder of the yacht was repaired by a passing ship sailing in a westerly direction. However, this temporary measure became ineffective and the yacht began drifting again. In two weeks it managed to change its location from 46° 50' S and 86° 15' E to 39° 00' S and 100° 47' E. At this speed it will take them weeks to reach Fremantle. Hopefully they will make it. I relayed this small story to you because it illustrates that amateur radio, despite modern marine communication systems and satellite technology, still plays a vital part in emergency situations, a fact which the authorities are very reluctant to recognise and give credit for.

A few days later I read the sad news in the local press that, due to Government economic measures, two key monitoring communication stations, Darwin and Townsville, will be closed, leaving only Perth and Brisbane to look after the 47 million square kilometres of sea for which Australia is responsible under international treaties. These two stations are manned around the clock by one person, on a 12 hour shift, on 12 HF channels, listening for possible distress signals.

It seems to me that there is an opening for some reliable individual to prove the usefulness of our hobby and to serve the community, provided the authorities will allow him to do so.

Wahroonga VK2WAH to WAUNFAWR GB2VK

Jo Harris VK2KAA, the historian of the NSW Division of the WIA, is on a special mission. She is travelling to Waunfawr, near Caernarfon, Wales in the UK to honour a special event.

The event occurred on 22 September 1918 (79 years ago) when the then Prime Minister of Australia, Billy Hughes stood by Guglielmo Marconi in Wales, and witnessed the first wireless contact between the United Kingdom and Australia.

On the Australian end was Ernest Fisk who was the managing director of AWA, and who lived on the corner of Cleveland and Stuart Streets, Wahroonga. The "Great War" (1914-1918) put great pressure on the need for a wireless transmission as it was feared contact between the UK and Australia could be lost. Fisk and Marconi had tried for a year to link up the two countries when they finally succeeded on 22 September 1918.

In honour of that event, Ku-ring-gai Council, The Historical Society of NSW, and Amalgamated Wireless of Australia (AWA) in 1935 jointly founded the building of a monument which now stands on the corner of Stuart and Cleveland Streets.

However, a few years ago in 1993, when the 75th anniversary of the transmission was celebrated, Jo discovered that there was no monument at the senders' end at Waunfawr in Wales.

Jo decided, off her own bat, to have a

replica built of the monument, and to send it to Wales. The monument shows Mercury with winged sandals standing, or rather running, around the globe. Mercury was the messenger of the Gods and the God of roads and travel in Roman mythology. Since its completion the replica has been exhibited at various amateur gatherings and a number of individual amateurs made donations towards the cost of this expensive project.

Jo left Sydney on 24 May to travel to the UK. The unveiling of the replica will take place at a special ceremony on 12 July 1997, at the old transmitting station which was established by Marconi at Waunfawr near Caernarfon. A number of local amateur radio clubs, politicians, press, and radio and television reporters will attend the unveiling of the replica which will be put into a glass case and displayed at the old Marconi transmitting building which, these days, is used as a mountaineering station because of its proximity to Wales famous Snowdon Mountain (1085 m). The replica has a plaque attached to it with the message: "From this site on the 22nd September 1918, Guglielmo Marconi transmitted the first direct wireless message to Australia where it was received by Ernest Fisk at Wahroonga, NSW. Presented by Jo Harris VK2KAA on behalf of friends of Wireless in NSW Australia. July 1997." Well done Jo! Congratulations.

Scarborough Reef - BS7H - Huang Yan Dao

This long awaited activity started at 0445 UTC on 30 April and finished unexpectedly at about 0645 on 3 May after only three days of operation during which the expedition made approximately 13,000 contacts.



The old Waunfawr station in Wales (see text). The transmission hall is at the back-left; the experimental section at the front was known as "The Extension".



The replica of the Wahroonga monument to be unveiled in Wales (see text).

There were lots of rumours about the cause of the sudden close-down, even bad weather and an approaching "Taifun" was mentioned.

On 24 May 1997, "The Sydney Morning Herald" published a 410 word report which gave some indication as to what really happened in the South China Sea surrounding the reef. Here are some quotations from the newspaper article. "China has demanded that the Philippines halt its "invasion" of rocky shoal in the South China Sea but the Ramos Government says it will resist China's attempts to enforce its claim over the disputed territory."

The article continued further, "China's Foreign Ministry spokesman Mr Shen Guofang said on Thursday that the Philippines had no right to raise its flag over Huang Yan island, the rocky outcrop that Manila calls the Scarborough Shoal. He accused the Philippines of harassing a "non-governmental Chinese organisation which

had sponsored an International radio venture on the island."

The article continued, quoting other allegations and counter allegations, but for our purpose the above news supplies an adequate explanation.

A detailed explanation came from Tim Trotter N4GN, who obtained the following information by telephone from several of the BS7H 1997 team members on their return to Guangzhou. "The Philippine Government announced on the 28th of April (within hours of the BS7H/mm departure from Guangzhou) that three Chinese military ships had been spotted in the area around Mischief Reef in the Spratly Islands. Mischief Reef is claimed by both the Philippines and China. Philippines President Fidel Ramos immediately lodged an official diplomatic protest with Beijing, and ordered increased Navy and Air Force presence in the area. Although the Spratly Islands lie some 300 miles to the south of Scarborough Reef, news of the escalating tensions in the region was immediately relayed to the BS7H crew. The expedition to Scarborough actually involved two Peoples Republic of China Ocean Bureau vessels (one carrying the BS7H team with an Ocean Bureau crew, the other carrying only Ocean Bureau personnel). The two Ocean Bureau captains were disturbed by the news from the Spratly Islands, but everyone agreed to press on toward Scarborough. On the first day of on-the-air operations by BS7H (30 April), two Philippine military reconnaissance jets overflew the reef at low altitude. Then, late on 1 May a Philippine Navy ship arrived at the reef, eventually followed by a second military vessel. Philippine Navy officers visited each of the three BS7H operating sites.

"In discussions with the BS7H team and the captain of the lead Ocean Bureau vessel, however, the officers asserted the Philippine position that Scarborough Reef lies within the 200 nautical mile Exclusive Economic Zone (EEZ) claimed by the Philippines. It is important to note that the Philippine Officers admitted that there is no Philippine claim to the Reef itself. The Captain of the lead Ocean Bureau ship, of course, stated the Chinese position that Scarborough reef is PRC territory and provides the base line for a 12 nautical mile Territorial Sea (TS) surrounding the reef.

"At first the Philippine Navy seemed to be concerned that the amateur radio operations of BS7H were somehow an "economic activity" subject to treatment under an EEZ claim similar to fishing or oil drilling. But, after observing the pile-up operations, this concern was apparently satisfied. Still, the Navy officers insisted that it was OK for the

PRC ships to safely pass through the Philippine-claimed EEZ, but they could not stop in any one place for a prolonged period of time. The captain of the lead Ocean Bureau ship was unable to reach any agreement with the Philippine Navy officers on this point. Finally, wishing to avoid a further escalation of tensions, the Ocean Bureau captains made the decision to leave the reef and to return to Guangzhou, cutting the planned seven day BS7H operation down to only three days."

If you managed to have a contact with BS7H, consider yourself to be lucky! It is my considered opinion that it will be now a long, long time before any amateur radio DXpedition can land on the rocky outcrops of Scarborough Reef which is situated at 117° 45' E and 15° 10' N about 210 km due west from the Philippine mainland.

St Paul Island CY9AA

Mike VE9AA, Doug VE1PZ and Dennis K7BV will be active from St Paul Island from 26 June to 3 July. Their goal is to make as many contacts as possible on CW and SSB on all bands from 160 to 2 metres. QSL via VE9AA, Michael Smith, 271 Smith Road, Waterville, Sunbury Co NB, E2V 3V6, Canada. They will be active on the usual DX frequencies

Annabon Island 3CODX

This DXpedition was ready to go for a seven day activity to this quite rare DXCC country situated opposite the Gabon coastline and belonging to Equatorial Guinea in Africa. There was a lot of freight and only two small aeroplanes to fly on from Libreville to the small island airport. However, the expedition had to be cancelled as the Guinean authorities, at the very last minute, would not grant 11 operators (out of 13) entry visas. The expedition now hopes to be on the air at a later date, possibly on the 11 October.

Malyj Vysotskij Island - OH5AB/MVI-R1MVI

This is a unique DXCC country, known by its former prefix of 4J1. The island is located in the territory of Russia, but is under the control of Finland. Malyj Vysotskij (Russian name) or Ravansaa (Finnish name) is located in the bay of Vyborg, north-west of St Petersburg. The DXpedition of twelve operators, five from Finland and seven from Russia, was planned to take place from 5 to 16 June. The all-band all-mode activity planned to run at least three complete stations 24 hours a day on the usual CW, SSB and RTTY frequencies. The two callsigns to be used were OH5AB/MVI and R1MVI. QSL manager for both callsigns is Orvo Arko OH5NE, Muukko, Fin-53400, Lappennanta, Finland.

Future DX Activity

* Gus SM3EVR/BV2 is active from Taiwan until October QSL via home call.

* Marc ON5FP and Kristof ON6NN will be in Monaco with the additional prefix 3A/ (SSB only) from 21 to 24 July. QSL via ON5FP

* Zoli HASPP will be in Aden at the end of June (not in May as previously reported) and hopes to be active in September either as 70/HASPP, 708DX or 708CW. QSL via HASYPP

* Eric FT5ZG has received an amplifier from the Clipperton DX Club and is now active again from Amsterdam Island. QSL via F5RQQ.

* Tim N2PC is active from Marshall Islands as V73AT for the next few years. QSL via K2CL.

* Nancy N3NS is now active in Senegal as 6W6/N3NS.

* 8J1RL is the Japanese Antarctic Research Expedition station at Showa Base on Ongul Island in the Antarctic. Can be heard on most weekends around 1000-1100 UTC, CW and SSB on 20 and 15 m. QSL via JARL.

* Fernando EA4BB has received his Angolan licence D2BB. He will be working in Angola and plans to stay for a year and half.

QSL via EA4BB via the Bureau, or direct.

* Iran. Ali EP2MKO was heard on CW on 20 metres. QSL via UA6HCW.

* Laurence GM4DMA will be active from Namibia until 17 August as GM4DMA/V5. QSL via his home call.

* VE3JRXK is in Honduras, wants to stay for two years, and hopes to be heard with the HR1RXK callsign.

* Mike K3UOC is active from Riyadh, Saudi Arabia as 7Z5OO until the end of July. QSL via W1AF.

* Lee N5HG is now active in Tanzania as SH3HG for the next 12 months. QSL via home call or via WY3V.

* Charles K4VUD intends to be active from Nepal 9N for 20 days beginning 8 July on 14195 and/or 14226.5 kHz around 1300 UTC. QSL to home call.

Interesting QSOs and QSL Information

* V31ZA - Keith - 14164 - SSB - 0530 - Apr. QSL via PO Box 1879, Behze City, Central America.

* BS7H - 21295 - SSB - 0558 - May. QSL via John Parrot W4FRU, PO Box 5127, Suffolk, VA-23435, USA.

* 4K52V - 14022 - CW - 1302 - May. QSL via 4K7DWZ, Club Station, POB 165, 370000 Baku, Azerbaijan.

* R60UPOL - Oleg - 14226 - SSB - 1334 - May. QSL via UR8LV Ukrainian QSL Bureau, Box 56 Kiev, 2520001, Ukraine; or direct to Oleg Satyrev, PO Box 9909, 310070, Kharov, Ukraine.

* 5H3JB - Bill - 14222 - SSB - 0558 - May. QSL via Hayden M Nadel NK2T, 22 Springtime Lane E, Levittown, NY 11756, USA.

* 6K97EAG - 14007 - CW - 0734. QSL via Korean QSL Bureau.

* V73NN - Jim - 14028 - CW - 0657 - May. QSL via N3OA via Bureau.

* VK0TS - Tom - 14260 - SSB - 0606 - May. QSL via S N Trotter VK1AUS, PO Box 2063, Kambah Village, ACT 2904, Australia.

* HK0TCN - Victor - 14164 - SSB - 0546 - May. QSL via Victor M Tesone, PO Box 464, Island of Sant Andres, Colombia.

* CO2JD - Juan - 7018 - CW - 1113. QSL via Julio E Henriquez HI3JH, Box 122, Santiago, Dominican Republic, Caribbean.

* V73EX - George - 14252 - SSB - 0638 - May. QSL via George Beckley, Box 3012, Majuro, MH 96960 Marshall Islands.

* V44NEF - Earl - 14190 - SSB - 0037 - May. QSL via Earl Francis, PO Box 565, Charlestown, Nevis Island, West Indies, Caribbean.

From Here and There and Everywhere

* Despite very bad propagation and a massive solar flare at 1800 UTC on 15 May,

which sent the A Index (geomagnetic activity) to a record height of 33. AX2ITU managed to contact 381 stations on a variety of HF bands, 2 metres and 70 cm. A total of 109 CW and 272 SSB QSOs were made with 24 DXCC countries and the VK1 to VK7 Divisions.

* QSLing directly. This seems to be a problem with VK amateurs. Within a week after the AX2ITU activity, as QSL manager I received about two dozen cards for direct reply. Quite a number of amateurs, mostly VKs I am sorry to say, did not include self addressed and stamped reply envelopes with their cards, yet all of them indicated that they expect a direct reply. What is the cause of this? Ignorance, forgetfulness or the perceived attitude that the "Divisions have the money". These special event callsigns are self funded activities and a self addressed and stamped reply envelope is a necessity for direct reply. If you sent a card without the return postage, our reply will go by the QSL Bureau system; we hope that you are a member of your local QSL Bureau, otherwise our card will never reach you.

* Calling all the VK6 amateurs who are employed by Telstra Australia. Did you know that your employer provides you with a nicely designed QSL card?

Such a card arrived the other day displaying the Telecom logo and the Telecom message proudly proclaiming that "This card was provided by Telecom Australia to Staff involved in Amateur Radio". There was no return postage attached to it!

* The Western Samoan (SW) QSL Bureau has closed down. There are only four active permanent resident stations on the island.

* The new QSL manager for RIFJZ is now Boris, U3AJ.

* Did you know that a new International Beacon is operating in Western Australia? Martin G3USF, IARU Region 1 HF Beacon Co-ordinator reports that the VK6RBP beacon is situated 28 km south east of Perth. This beacon is similar to all the other IBP (International Beacon Project) beacons and is one of the 14 beacons on the air sponsored by the Northern California DX Foundation (NCDXF). The power of the beacons is 100 W which steps down to 0.1 W in four stages, transmitting for 10 seconds on the IBP frequencies on 14, 18, 21, 24 and 28 MHz.

* Chris ZS8IR left Marion Island on 24 May for Cape Town. The future of amateur radio on the Island is uncertain, due to regulatory changes in the South African Environmental Affairs Department.

* On 1 June the "World's Longest Bridge over Ice Covered Water" was opened in Canada. The bridge connects Prince Edward Island to the mainland and is 12.9 km long.



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with the highest span 60 metres above water. To commemorate this occasion, Industry Canada (the regulatory body) and Radio Amateurs of Canada (RAG) have granted all amateurs of Prince Edward Island the use of the special prefix XNO in place of the VY2 prefix. Activity will be from 29 May until 1 September.

* L70FM in Argentina was active celebrating the seventh anniversary of "Radio Club Rosario" QSL via LU4FM

* Afif 7X2RO reports that the enclosures of nearly all arriving letters were stolen. He now asks that all QSLing to be done via F6FNU or OM3CGN.

* Chris ZS8IR on Marion Island reported, before his departure, that all the rhombic antennas, including the towers, were dismantled. The HF system on the island is being downgraded to a single dipole and a single tower.

* The Radio Amateur Callbook, with its distinctive "Flying Horse" logo, was first published in 1920 and its 75th anniversary edition (for 1997) appeared at the end of 1996.

A few months later came the news that the printed version of the Callbook will be discontinued. In future the Callbook will only be available on CD-ROM for computer

* R60UPOL was a special event station operated by Oleg UR8LV at Chelyuskin Polar Base, celebrating the 60th Anniversary of the first QSO from the North Pole by the Russian Arctic Explorer Krenkel.

* Chuck N4BQW/P/KH7 was heard on 17 May from Kure Island. QSL via WA4FFW.

* Tom VK0TS came up on 14260 kHz on 26 May. Jim VK9NS was running a list for him.

* Gary N7EKX from the State of Washington in the USA used an old Heathkit two watt QRP rig and a two element Quad at 16 m high to make a CW contact with AX2ITU. He received a 339 report from Sydney.

QSL Received

V897UW (2 w op), 4L5O (24 m - TA7A). FW2EH (6 m - DJ2EH); XZ1N (5 m - W1XT); ZY0SK (2 m - PS7KM), ZD9CR (3 m - KA1DE)

Thank You

Many thanks to all those who took the trouble to supply me with news and other information. Special thanks to VK2XH, VK2KAA, VK2KFU, VK2TJF, N7EKX, the *North Shore Times*, *The Sydney Morning Herald*, and the DX publications *QRZ DX*, *The DX News Sheet* and the *425 DX News*.

*PO Box 91 Dunal NSW 2155
ar

Over to You - Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents

Morse Communication and Languages

I must give D Palmer (VK2TMP) a bit more "rubbish" and "nonsense" in reply to his *Over to You in Amateur Radio*, May 1997.

1. When I worked in Korea and Japan I found that many people were proficient in written English but could not pronounce it. We therefore often had to use written messages to communicate.

2. I can make contacts and pass on written messages in CW, eg in Finnish, Croatian and Vietnamese without speaking a word of the language. Try this with SSB.

3. The ultimate emergency is at war. The military signal corps is still using Morse code and requires it in their aptitude test. Anyway, most commercial HF transceivers have a CW option.

4. If one tunes around, many CW signals outside the amateur bands can be heard. Are all of these coming from Dodos or idiots?

5. Radio amateurs can (and will) play a vital role in emergency situations, if all other services fail. It is one of the very few justifications for our continued allocation of valuable HF spectrum. Practically the only distinguishing advantage of a fully fledged HAM over others is his ability (to send, at least) Morse code. That's why we must keep it; if only for survival!

6. By the way, I learned (compulsory) Latin at school and I am still grateful for it. Apart from other advantages, I learn scientific terms and names much easier because I understand what they mean.

Kris Gerhardt VK4CPG
26 Mitchell Avenue,
Hervey Bay QLD 4655
email: gerhardi@ozemail.com.au

CW Obsolete?

Thanks to Les Daniels VK2AXZ (OTY June 1997) for pointing out that the anti-CW lobby claims that "[it] is now obsolete in marine communications and the armed forces".

At a recent briefing, conducted by the Royal Australian Corps of Signals, it was revealed that the Corps requires its operators to be proficient in Morse at 12 wpm.

Whatever the pros and cons of the current CW debate, the argument that it is obsolete in the armed forces is without validity.

Graham Thornton VK3IY
17 Britannia Creek Road
Wesburn VIC 3799.

Proposed New Format for the Call Book

The WIA News item about proposed changes to the method of publication of the Call Book seems to ring alarm bells for some of us retirees without computers and failing eyeballs!!

The suggestion only to publish the Call Book in digital form on CD-ROM has prompted the writer to ask your sub-committee to keep in mind those of us who rely on the existing format for access to the Ham fraternity.

My XYL and I keep a copy of the Call Book in the car and another in the shack of course, and not a week passes without these books being used. The only criticism we have of the present Book is that the print size of the listings is a bit too small for many of us.

Max Morris for M Morris VK3GM
and W J Morris VK3AWM
PO Box 222
Rye VIC 3941

Update

New Zealand ARDF National Championships

(Published on page 19 of the June 1997 issue of Amateur Radio magazine)

We have received an e-mail from Mark Duggins VK3JMD pointing out that he had incorrectly inserted Jason VK4YOL's callsign as VK3YOL in both the VHF and HF results table.

It might be a good idea to correct your copy of the June 1997 issue of *Amateur Radio* now.

Equipment Review - Two Metre Amateur Band DF Receiver

(Published on page 13 of the June 1997 issue of Amateur Radio magazine)

We accidentally omitted giving credit to Ron Fisher VK3OM for the two photos of the DF receiver.

It might be a good idea to correct your copy of the June 1997 issue of *Amateur Radio* now.

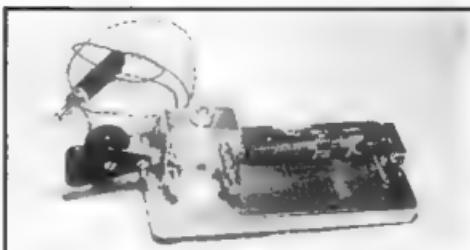
Pounding Brass

Stephen P Smith VK2SPS*

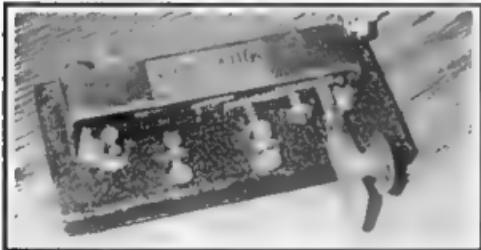
This month, something a little different. A look at some Australia semi-automatic keys, ranging from 1925 to 1965, as used by the old Post Master General's Department (PMG). I will include some historical hand keys in a future column.



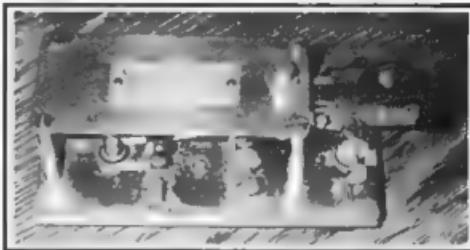
A MacDonald's Pendograph, patent number 11389, made in Adelaide.



An Autoplex, by J Vaille, Leslie Crt, Burwood, Victoria.



A Simplex Auto, by Leo G Cohen, Melbourne, Victoria.



A variation of the Simplex Auto, by Leo G Cohen, Melbourne, Victoria.

*PO Box 361, Mona Vale NSW 2103

International Amateur Radio Union Monitoring Service (IARUMS) – Intruder Watch

Gordon Loveday VK4KAL*

Return of the Prodigal!

We can well do without this one! The Russian Woodpecker is back in our midst again, this time on 18.130 to 18.160 MHz, and maybe other bands as well. Strengths of S9 are being heard. At my QTH it has been 45444 (SINPO), which is about S7.

It has also been heard in VK2 and VK3, but the Intruder Watch Service needs many more observations and beam headings (in degrees). The general direction has been given as south of east from the Melbourne area.

It is not the Australian Jindalee OTHR, as this operates at a much higher frequency and appears as a "swishing sweep" (and high speed at that) across most frequencies.

80 m Intruder

Another encroachment is in the 80 m band. It is coming from south of New Zealand, bearing around 170 degrees, signs in A1A (CW) on frequencies from 3.543 to 3.616 MHz from 1945 to 2100z daily. The callsigns are those we normally associate with the UK, ie GKE 1 and GKY 1. Other callsigns being used are SXA and SXH. Data

is usually passed, but it has also been heard using LSB.

Logs to hand have reports of over 60, but here again we need more information from VK3 and VK5. I've not heard any signals this far north and west.

A reminder. The IWS needs frequency, date, UTC and beam headings in degrees. Please forward to the address at the foot of the column. Unfortunately, no packet at present!

Stop Press

Just to hand by fax. Alex VK6APK has received confirmation of removal of VOA on 14.270 MHz as heard on 31 May 1997 at 2333 from Phil.Goodman@beng.voa.gov. It was a harmonic from the Philippines. Congratulations Alex.

*Federal Intruder Watch Co-Ordinator. Freepost No 4
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Repeater Link

Will McGhie VK6UU*

The Internet system that allows amateurs and voice repeaters to be transmitted via the Internet, is in the news in VK6 of late. Readers of this column may remember the article in the December 1996 issue of *Amateur Radio* about using the Internet to talk from Australia to voice repeaters in other parts of the world. The next step has been taken in VK6, with the reverse situation. Amateurs are appearing on some of our local repeaters from the USA and Canada. A local VK6 amateur is using his Internet set-up to link amateurs from these countries into our voice repeaters in Perth.

The link up is not automatic or permanent, but requires an amateur to do the operation from his Internet computer and then provide the radio link, into and out of the local voice repeater. At all times the system is monitored, operated and controlled by the local amateur doing the link.

A further step to be taken could be to connect a voice repeater into a permanent automatic Internet system just like is being done in other parts of the world. At this stage there are thoughts to do just that in VK6, and I would imagine in other areas of Australia, but we have a problem. The problem is that amateur regulations prevent connecting voice repeaters directly or indirectly to the public telephone network. The latest regulations on voice repeaters say just that, directly or indirectly. Connecting the Internet via a radio link is an indirect connection.

However, I could be completely wrong. What happens in Australia is that regulations are written to contain the amateur service and then we amateurs spend a lot of time arguing about what they mean. This is happening right now with the Internet connection situation. The SMA have been written to, asking if connecting the Internet to a voice repeater in the method described, via a radio link, is legal. This letter originated from an individual amateur straight to the SMA. The WIA were not involved. Interestingly, the letter went to the SMA and not to the WIA. The WIA should know if such a connection is legal or not.

Now before you begin to think I'm going to start having a go at the WIA this is not the case. I have had many conversations with John Martin of FTAC, who has to try and understand the detail and intent of the regulations the SMA lay on us. John is in the best position to have a good grasp of the intent of amateur regulations and has many times pointed out complexities in their

wording and interpretation. At times John amazes me at what he can see in the wording. Now that the Internet link situation has occurred, the meaning of direct or indirect connection to the public telephone network for voice repeaters is being looked at.

It is important to understand this regulation. Any amateur can link other amateurs via the Internet onto an amateur band. It is just phone patch in a modified form. The strange situation is that that same amateur cannot shift the frequency of the link onto a repeater frequency. Why, I hear you ask? I don't know for sure, but it could be concern that non-amateurs may be transmitted from the Internet to amateur voice repeaters. But why the distinction between a simplex frequency and a voice repeater?

The point needs to be made that the software that controls the repeater link system requires those wishing to use the system to register their callsign and other details. These details are then checked with a list of amateur callsigns on CD ROM. Sure, you could just look up a given amateur and type in the details, but the person doing this has his e-mail address riding along with the information. This non-amateur could be tracked down. This is a lot more secure than any non-amateur buying a transceiver and going on air. This, of course, happens from time to time and we have to live with it. I don't know if the Internet connection to amateur repeaters has been pirated, but it is a lot more difficult to do.

Once again regulations are applied to the voice repeater service that restrict experimentation and no reasons are given. Why can we transmit Internet voice on one frequency on two metres and not another because it is a repeater frequency? All along, we amateurs, particularly the ones actually doing the experimentation, are being limited for unknown reasons.

New Regulations

The long awaited new repeater and beacon regulations have become law. It took about eight years to get to this point and, in my opinion, the wait was not worth it. These regulations are not new, as they have been about for a couple of years, they just never became law. All the other TLSS relating to amateurs became law a few years ago, but the repeater and voice TLSS did not. Up until now, repeaters and beacons have been operating under the original RIBs.

There have been gains with these repeater TLSS, but not in the spirit that was discussed with the SMA some eight years ago. We must just keep slogging along, trying to achieve enlightened voice repeater regulations, but I don't think it will be in my lifetime.

Site Fees to Change

We have had a win that should never have been necessary. Repeater and beacon licence fees are to change back to the original system, of one fee for a given site callsign. However, the site investigation fee for new licences will remain and, I have been told, increased. The fee structure was changed a while back to a fee for each transmitter, a cost burden that saw some repeaters and beacons shut down.

In VK6 the cost increase was about three times for our repeater club. As a result,

WIA MORSE PRACTICE TRANSMISSIONS

VK2BWI	Nightly at 2000 local on 3550 kHz
VK2RCW	Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3COD	Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz
VK3RCW	Continuous on 145.650 MHz, 5 wpm, 10 wpm
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK4WCH	Wednesday at 1000 UTC on 3535 kHz
VK4AV	Thursday at 0930 UTC on 3535 kHz
VK4WIS	Sunday at 0930 UTC on 3535 kHz
VK5AWI	Nightly at 2030 local on 3550 kHz
VK5VF	Continuous on 145.650 MHz, 5 wpm to 12 wpm
VK6RCW	Continuous on 147.375 MHz, 3 wpm to 12 wpm

several licences were not renewed. It will be interesting to see if the SMA charge a fee to have these licences re-instated. After all, the site investigation has already been done.

Also, will money be refunded that was paid under the cost per transmitter system? Not only money was involved but a lot of time spent trying to minimise costs by repeater clubs. A costly change to the amateur service that should never have happened.

29 MHz Gateway Update

The years keep rolling along and still no licence for the 29 MHz gateway in Perth. It does look like it has taken another step, with the license application generating a query from the SMA to the Federal WIA asking if it conforms to the WIA band plan. It does, and this information was supplied by the VK6 WIA in their application to the SMA. But I gather we have to be sure. Yet another delay.

While on the subject of the 29 MHz gateway and the band plan, three channels have been allocated by FTAC. They are 29.120, 29.140 and 29.160 MHz. The Perth gateway is to go onto 29.120, and it is recommended that all 29 MHz gateways go onto the same frequency of 29.120 MHz. Gateways will require CTCSS input access and, as the 29 MHz gateway transmitters will not be encoded with CTCSS, they will not link. If this linking restriction is lifted by the SMA, then automatic linking could occur when band conditions allowed.

The recommended CTCSS tone to access the 29 MHz gateway on 29 MHz is 141.3 Hz. For an amateur to access a 29 MHz gateway on 29 MHz, this 141.3 Hz tone will be required. This will require you to construct a CTCSS encoder, as HF equipment does not normally come with CTCSS encode or decode.

If all gateways operate on 29.120 MHz, all using the same CTCSS tone, it will make monitoring and using the gateways easier. Any interference between gateways, when propagation allows, should be seen as a bonus for now. Let us see how the single gateway frequency works in practice first. If there are problems, then frequency changes could be made. It is important to remember that the single frequency idea makes it easy to link these gateways, if the regulation preventing this is removed. Yet another silly regulation.

It was a bit of a rush putting this together this month, as I have been busy. I hope the information is accurate. Now e-mail it to *Amateur Radio*. That is the easy bit.

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Packet VK6UU @ VK6BBR
E-mail: will@vole.faroc.com.au

Spotlight on SWLing

Robin L Harwood VK7RH*

News has come through that Radio Australia is drastically reducing its services as from this month. No date has been given yet so it may have already happened. In last month's column, I reported that several language services have been axed, namely French, Thai and Cantonese. Also, English programming is being reduced. Reportedly the Darwin site is being closed, which I stated was incomprehensible because the bulk of Radio Australia's audience is in SE Asia and the Pacific. The primary reason is budgetary but there have been reported comments from some Federal parliamentarians that Radio Australia should not be broadcasting news of what is happening within the target areas and should be concentrating on Australian news and information.

I am compiling this in early June so I do not know what will have happened to Monitor Radio International, which was scheduled to close on June 30. The parent organisation, the Christian Science Publishing Society, did indicate that they may be continuing solely with their religious programming if the senders had not been sold before then. Sadly, their excellent news and current affairs will be no more. I did like their balance and coverage compared to the official VOA news which, naturally, reflects US government foreign policy, although they say they are independent.

It was confirmed that the Voice of Greece in Athens will be using VOA senders in the USA to rebroadcast to the Americas and is likely to commence in September. Up to 12 hours per day will be aired. The VOA has been broadcasting from Greece and Rhodes for many decades and now Athens will be using the VOA to increase their range to where there are substantial ethnic Greek communities in the States and South America.

As many of you are aware, there are some international and domestic broadcasters who have been putting up their audio on their Internet web pages. To get this, naturally, you will need the appropriate software such as

Real Audio TM or Streamworks, which can be easily downloaded. However, the majority of program makers seemingly have opted for Real Audio. It is very strange listening to a news broadcast or a missed episode of "Communications World" on the VOA through your sound card. Sometimes it will flow very well but, if the traffic on the net is heavy, the feed can be disjointed or disrupted.

The audio quality usually depends on your modem speed and the amount of Internet traffic. However, I still prefer short wave as it is reliable and doesn't cost anything compared to paying for access to the Internet. My ISP costs \$4.50 per hour at peak rates so you can readily appreciate that I mainly restrict my surfing to off-peak hours.

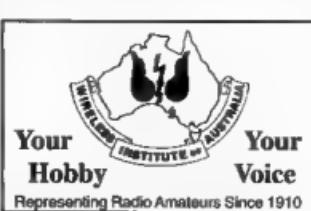
I recently received a letter from an English reader of this column. Nice to know that I am being read throughout the world! BH of Nottingham wrote to tell me that amateurs and professional HF users in the Middle East are being plagued by deliberate interference from Arabic speaking stations, particularly in SSB land. It appears that the increasing number of non-licensed operators or pirates using HF has escalated the use of satellites and other digital forms of communications by legitimate operators.

The HF maritime allocations where you could find CW are rapidly shrinking and should be gone by 1999. However, many stations are not waiting till then, pulling the plug earlier as the number of users of the key has dramatically shrunk in the past 12 months. Just tune between 8.44 and 8.7 MHz and note the number of remaining stations there compared to 10 years ago when it was heavily congested. There appear to be a number of HF pirates popping up there now, judging by the amount of Asian operators recently heard there.

Note that the Southern Cross DX Club now has a Web page. It has details of the club with links to other users. It can be found at <http://holstoi.saccii.net.au/~stephen>. The New Zealand Radio DX League can also be found at <http://navigator.co.nz/nzrdl>. Another link to SWL sites has been put up by a friend, David VK3NDS, at <http://www.bsba.com.au/~dsmp/>. The Electronic DX Press can be found at <http://www.wp.com.edxp/>.

Well, that is all for this month. Until next time, the very best of listening.

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VHF/UHF – An Expanding World

Eric Jamieson VK5LP*

All times are UTC.

Meteor scatter propagation – Part 2

Ron VK3AFW says the following points are worthy of consideration when it comes to using meteors for contacts on two metres.

1. MS in VK isn't easy and doesn't compare to the Northern Hemisphere conditions.

2. The minimum station requirements for average conditions are 100 watts to a 13 dBd gain antenna in the clear and a 2 dB NF receiver with effective noise limiting;

3. Paths up to around 1600 km can be spanned on two metres most days via meteor scatter scheds;

4. The meteor rate is higher before and just after local sunrise than later in the day; and

5. Meteor shower prediction is not a mature accurate science, or the science is not widely known.

These facts are not new but it is useful to re-confirm them. The following hints are offered to would-be MS operators:

1. Strict adherence to an agreed protocol is necessary. Stray from it and you will confuse the other station and probably miss out;

2. Be within 100 Hz of the other station's frequency and stay there. Make adjustments with your RIT to clarify the other station's speech if necessary. I use a timer to switch the rig on two hours before a sched to minimise my drift.

3. Persist with calling. You can't hear the meteor that is going to propagate your signal. You can't see or predict it either. To win against the statistics you must call in every one of your time slots for up to an hour. You might complete in the first 10 seconds, but it's just as likely that you might not complete until the 59th minute. Have a glass of water and some lozenges handy. Don't give up. The next interval might be the one when a huge piece of space junk falls out of the sky, ionising the ED layer from here to Darwin.

4. Speak quickly but distinctly. I can (when fully wound up) get five sets of callsigns or ten reports out in five seconds, so a one second burst conveys one set of info. If you take five seconds for two sets of callsigns your chances of completing are more dependent on longer bursts which are rarer. It's not easy to keep this up for 30 minutes. You will feel self conscious and a bit stupid.

5. Expect the unexpected. A loud and long burst after listening to the ambient noise is disconcerting. My brain used to freeze for five seconds when this happened, causing me

to miss transmitting back on the tail of the burn. There are too few long burns not to use every one. This disorientation happens to most people starting out on this mode and experience is probably the only way to overcome it.

Many thanks to Adrian VK2FZJ4, for his long hours on the band and persistence in listening for weak signals on differing frequencies. Adrian's telephone number is 07 5499 9869 but don't necessarily expect him to answer during any scheduled times! ... de Ron VK3AFW.

Dale Cawie VK5AFO asks: "Is any one out there able to conduct some experiments using meteor scatter? I'm in a position to give it a go from Mt Barker in South Australia. PF94 locator, using two nine element Yagis at 50 ft and 80 watts. I've not heard a squeak from the beacons in Sydney whilst listening in the evenings. Any pointers would be handy."

Mike VK2FLR replied: "I am surprised that Dale has not heard the VK2RSY beacon via MS on 144 with his 2x9 element Yagis. VK2RSY is currently exactly on 144.420 and should be audible via meteors. I certainly hear VK5VF via MS".

Mike suggests to Dale, and any others interested, to try in the mornings when random meteor activity is much greater than in the evenings. If Dale can hear VK2RSY then Mike will set up some scheds.

Part three of meteor scatter experiments next month.

Six Metre Web Page

A message from Jim Cotterill VK1ZFG sent to vk-vhf@marconi.mpc.mq.edu.au and relayed via Ron VK3AFW, states that "Strictly 6 – Australia's six metre Web page has recently been updated to include a list of all known six metre capable radios with individual links to further info on the Net. Hope you find it useful at <http://www.qsl.net/vk1zfg> Jim's own e-mail is CanberraBoy@msn.com".

Notice of Proposed DXpedition

Steve Gregory VK3OT at [steve.vk3ot@h140.aone.net.au](http://h140.aone.net.au) advises he proposes visiting SEANET 1997 next November. He may activate Melville and Bathurst Islands, about 100 km north of Darwin, and will consider going to Christmas Island to survey it for future operations during Cycle 23.

He first activated VK9X in 1980 and again in 1982 and made over 16,000 six metre QSOs to 25 countries including 9N1 and HS1. He also activated VK9Y in 1982 and heard FY7 long path.

This prompted him to supply VK9YJ with a 9 el Yagi in expectation of his success from there. VK9YJ worked all continents in 48 hours and around the world both ways to South America using just 100 watts and the 9 el Yagi, which now graces the VK3SIX site.

WA6BYA has indicated he will visit Seychelles in Cycle 23 and Steve will also consider FR7.

"*So the Indian Ocean is the place to go as well as rare grid squares in the north-west of VK6 for QSOs to Europe. Ideas wanted please...*" ... VK3OT QF12ag.

Microwave Tests From Port Lincoln

David Minchin VK5KK advises that following a visit to his brother Hans VK5NME, Hans is now operational from Port Lincoln, using a Philips FM900, an FM rig of about 30 watts, and a three element horizontal beam. He operates most nights from 1030 UTC on 146.425 MHz. Hans has worked his father VK5AKM at Wasleys and David at Salisbury Heights, both over the same path distance of 265 km, and would welcome contacts.

David VK5KK said: "I took the 2.4 GHz and 10 GHz gear to Port Lincoln to listen to the VK5VF beacons and try to work VK5AKM. I expected to hear the 2.4 GHz beacon and maybe something on 10 GHz from VK5AKM as we could hear him on two metres at 5x2. We ended up on Winters Hill at Port Lincoln, about 130 m ASL, at 0230 with plenty of cloud and wind but no rain or unusual propagation. The 10 GHz beacon was audible at S1. Over the next half hour its signal rose to S5 (20 dB over the noise) with QSB, but never disappeared. VK5VF runs 20 watts EiRP on 10 GHz from 600 m ASL. Path distance 269 km."

"VK5AKM (from home at Wasleys) then ran a carrier. As has been noted of late, the stable TCXOs that are being run by various 10 GHz operators mean that you don't always need to go tuning; in this case I heard the carrier switch on! We made a two way SSB contact on 10,368 455 MHz at 0240 (5x2 sent, 5x3 received), path distance 268 km with about 190 km over land. VK5AKM is about 100 metres above sea level, running 250 mW into a 600 mm dish, mounted 13 metres above ground. QSB was evident but not as marked as the beacon. The contact lasted for about 20 minutes."

"With our current equipment, under 'normal' conditions it looks like 268 km might be close to the limit on the water paths we have around Adelaide. The usual effects on 10 GHz signals over a water path were evident – multi-path plus or minus 10 degrees. Again a lack of propagation on the lower VHF frequencies doesn't always

correspond with a lack of enhancement above 1 GHz.

"The 2.4 GHz beacon was a consistent 25-30 dB over the noise (S7-9) using a 600 mm dish. While the beacon has better than 200 watts EIRP to the west, the 12 dB drop in receiving gain of a 600 mm dish on 2.4 GHz should level this out. The results showed that 2.4 GHz performed 6-10 dB better than 10 GHz over the path; well, at midday on a cloudy day anyway! The QSB effects observed on 10 GHz had no correlation to those on 2.4 GHz. In fact, the QSB was less than that observed on two metres before. One explanation for the consistency of the 2.4 GHz signals is the cloud cover. I have noted enhancement before with clouds at 3-4000 feet. Certainly worthy of more study!"

UKSMG Membership

Adam Maurer VK3ALM, VK Country Manager for the UKSMG, is seeking more applicants to join. At present VK1ZFG, VK3ALM, VK3ANP, VK3OT, VK3ZNF, VK4APG, VK5LP and VK7ZO represent the VK members – only a handful of operators.

He says: "Some operators have thanked me for the offer to join, but state they get all the news they need from the Internet. True, there is certainly a lot on the Net, but it doesn't materialise out of nowhere."

"There is a group of thankless individuals out there putting all this together, for other operators to enjoy. The UKSMG WWW site is a fine example. There would be no WWW site if there wasn't a membership base from which to begin!"

"UKSMG funds are ploughed back into DXpeditions around the globe and includes DXpeditions that will be worked in Australia in Cycle 23. An example of their support for six metres is the provision of equipment for SUIER in Egypt to come on the band."

"The quarterly magazine "Six News" is becoming more focussed on in-depth articles that are best published on paper rather than electronically. The WWW site is the best source for transitory news. They are entirely different media, so even if you are on the Net you will be missing out!"

"If you would like further information please send a business sized SASE to Adam Maurer, VK Country Manager, 1 Jeffrey St, Dandenong Nth, VIC 3175. E-mail address is adam@rnt.com.au

"Please note, due to the "chalk and cheese factor" regular packet operation has ceased from this station (like many others) in favour of the Internet Any ZL membership enquiries can be directed to Bob McQuarrie ZL3TY. Bob's e-mail address is bmcquarrie@minidata.co.nz"

From Ron VK3AFW: "10/5 East Coast

Aircraft Net, 144.200 MHz, 2236 VK3AFW worked Les VK1BUC 5x1 5x2, 2240 Peter VK1RX 5x6 5x8, 2243 Chris VK1DO 5x7 5x8. Later, on 144.100 Ron worked Barry VK3TBM/p near Moe. He was QRP with a single quad loop.

"13/5: 144.080 weekday morning Bass Straight Net. 2211 Andrew VK7XR worked Ron VK3AFW 5x9 5x9, Max VK3TMP 5x7 5x7, and Des VK3CY 5x1 5x2. Ron was also heard by Andrew on 432 FM at 5x2 but equipment malfunction prevented a two-way QSO. Who said tropo enhancement is a summertime thing?"

"17/5: East Coast Aircraft Net, 144.200 MHz, 2200-2315 Quentin VK3DUQ and Max VK3TMP worked VK2ZAB and VK1VP. Ron VK3AFW and Max VK3TMP worked VK2TWR. At 2253 Max and Ron copied VK2DVZ (presumably off a meteor) at 5x4/5x5. VK2DVZ was possibly calling VK2TWR, signals in very brief and only the call sign heard once. Later that morning Max VK3TMP had further QSOs with Rod VK2TWR on both 2 m and 70 cm. Rod is only running 20 W on 70 cm at present.

"On UTC day 24/5 from 2243 to 2246, I worked the following via aircraft enhancement. Rod VK2TWR, Chris VK1DO, Les VK1BUC, all Q5 and between S3 and S6. Chris VK1DO also worked Gavin VK3HY, Ken VK3DQW and Les VK3ZLS. 2303 VK3AFW to Trevor VK5NC, conditions patchy; 2331 to Barry VK3TBM/m 5x3. He was running less than three watts to a Vee-dipole from Mt Tarrengower near Castlemaine, about 130 km NNW from Melbourne."

Geelong Beacon Update

Charlie VK3BRZ advises of the recent update to the Mt Anakie two metre beacon antenna system.

"Previously the beacon was fitted with a crossed-dipole arrangement. Tests using an identical antenna revealed that it was far from omni-directional, behaving more like an ordinary single dipole. Also, reports from operators to the north-east seemed to indicate a lower than expected signal strength compared to the repeater on Mt Anakie.

"I replaced the old antenna with a pair of four element Yagis, fed via a two-way power splitter. One Yagi is pointed at 35 degrees, ie north-east, and the other at 293 degrees, ie Adelaide direction. The gain of each Yagi is 8 dBd, so that with the power split two ways, there should be an 8 dB increase in signal strength over a true omni-directional antenna (I suspect it will be more in fact, since the crossed dipoles shoot an appreciable signal straight up in the sky).

"The beam width of each antenna is 50

degrees at the -3 dB points, and the beam width at which the gain drops to 0 dB (ie back to what a dipole would be) is 84 degrees. If you transfer these figures to a map you will see that the beacon covers the main areas of significance to us. Most DX users should observe an improvement of between 3 and 8 dB at least. Already reports from VK2TWR at Nimutabel, VK2EMA at Tottenham and VK5LP at Meningie confirm this. Unfortunately, the signal to VK7 will have all but disappeared. You can't have everything! Perhaps Ron VK3AFW might be persuaded to re-locate the VK3RTG beacon so as to cover the north-west/south-east paths."

Charlie would appreciate reception reports, not only from those in the favoured directions but those to the sides and from VK7.

Ron VK3AFW replies: "Charlie VK3BRZ has wanted to set up the VK3RGL beacon with a beam towards VK6 for some time. On 19/5 Andrew VK7XR worked Rod VK2TWR on two metres SSB and was told that the VK3RGL beacon had two beams connected, one towards the north and one towards the west. This means that Andrew, and the other VK7s, are without a useful propagation indicator. Because the Geelong beacon was to the west of Melbourne and sited with an unobstructed view of the horizon, it was heard under different conditions from the Melbourne beacon. It's hard to know what's best – probably a mix of beamed and omnidirectional beacons in close proximity is the answer."

"Regarding VK3RTG/b, I would like to change the aerial and its site and also rebuild the keyer and the RF deck, but my own station needs some attention and will get priority. VK3RTG/b runs only seven watts to a halo and is screened by nearby higher buildings, except to the east and south-east. I hope to erect a 3 dB gain antenna and increase the power to 25 watts in the next 12 months. The changes to VK3RGL/b have made an upgrade more important. I'm not sure about an alternative site."

Portable Operation

I received a letter from Andrew Miller VK5SDL who operated portable from Hampden via Eudunda, 100 km NNE of Adelaide on 15/4/97. Andrew used 100 watts to a G3T 2/70 vertical antenna.

During the course of that evening he set out to work as many two metre repeaters as could be found, ending with 2 x VK7, 2 x VK2, 10 x VK3 and 11 x VK5, as follows. 146 625 VK7RMD, VK5RLZ, 146 650 VK5SRNC, VK3RGV; 146 675 VK5RSV, 146 700 VK5RMN, 146 750 VK5RLC, VK3RBA; 146 800 VK3RMA, 146 825 VK5RBV; 146 850 VK2RGF, VK5RHO;

146.900 VK3RSH; 146.925 VK5RLH; 146.950 VK3RWZ; 147.000 VK5RAD, VK2RBH, VK3RGL; 147.025 VK3RMK; 147.050 VK3RVL; 147.075 VK7RWC; 147.150 VK3RCV; 147.200 VK2RWB; 147.275 VK3ROW; 147.925 VK5RLD He found it an interesting experience to access simultaneously repeaters in Adelaide, Broken Hill and Geelong.

Responding stations were VK5OZ, VK5KCX, VK7NDH, VK7KY, VK7EQ via VK7RWC/VK7RMD, VK5NFJ, VK3TD, VK3IP, VK3DVL, VK3UWW, VK3JGF, VK3MLZ, VK3HMA and VK3XC. Several better equipped Adelaide stations received excellent reports from VK7 – these included Steve VK5OZ and Barry VK5KCX.

On 24/4 between 2200 and 0100 (25/4) he worked VK2KAW, VK2ZMP, VK2BGA, VK2APP, VK2DPG, VK3MV, VK2KVKY, VK2FBK, VK1ZQR, VK3ZGL, VK2H1, VK3TCM/5 and a few others using 146.650 VK5RNC, 146.750 VK2RWG and VK5RLC, 146.800 VK3RMA and VK2RTD, 146.850 VK2RGF, 146.900 VK3RSH, 146.950 VK3RMZ and 147.000 VK5RAD and VK2RBH. Unlike the previous occasion none of this activity could be heard in Adelaide.

Melbourne Area

Max VK3TMP at Somerville on the Mornington Peninsula worked the following: 5/4: 2246 Gordon VK2ZAB 432 5x1; 12/4: 2245 Joe VK7JG and 23/5 Andrew VK7XR 144 5x9-, strongest ever heard, 2316 VK7XR 1296 5x4; 15/4: 0857 Phil VK5AKK 144 5x5, 1110 Barry VK5KCX 144 5x2, 1111 Steve VK5OZ 144 5x3, all Adelaide area; 15/4: Cohn VK5DK Mt Gambier worked on 144 at 1001 and on 432 at 1040, but unable to work him on 1296 MHz; 23/4: 0534 Rob VK3DEM and 0536 Roger VK3XRS, both Bairnsdale on 1296 and 5x5.

Channel 1 in New Zealand

Adam VK3ALM reported on 26/5 "Bob ZL3NE received a letter from Radio Operations saying that from the 16/06/97 TV4 will be operating on Ch 1 horizontal from Auckland sky tower!"

"All Auckland stations will need to be re-tested and will not be permitted to operate on 50 MHz until this is done! Not good news. NZART had a meeting with TV3 and were told that there would not be any transmitters or translators operating on Ch 1 for TV4, but this appears to be not true. A concern to all of us but what can we do?"

Andrew Hay VK7XR says that although overall the bands have been relatively quiet, there are still days when things happen. The following are some entries from his log book:

20/4: 2134 VK3ATQ 50 519, 2213 VK3AFW 144 529; 21/4 2215 VK3AFW 144 529; 23/4: 2132 VK3ANP 50 5x5; 27/4: 2212 VK3AFW 144 5x2; 29/4: 2213 VK3AFW 144 529; 30/4 2214 VK3AFW 144 519.

13/5: 0915 VK2TWR 144 5x6, 0921 VK2TWR 432 5x1, 0925 VK3BWT 144 5x1, 1025 VK2TWR 432 5x9, 1029 VK2RBC/b 432 S7, 1030 VK2RBC/b S9, 1036 VK3BWT 144 5x1, 2127 VK2RBC/b 144 S5, 2127 VK2RBC/b 432 S3, 2130 VK3RGL/b 144 S1, 2133 VK3ATQ 50 5x5, 2135 VK3BQS 50 5x5, 2211 VK3AFW 144 5x9, 2212 VK3TMP 144 5x7, 2215 VK3CY 144 5x2.

That 17000 km Barrier

Further to the listing of three amateurs breaking the 17000 km distance to the UK/EU area in June *Amateur Radio*, it now appears that the contact between Steve VK3OT and Martyn G3UKV is 16818.9 km, so that leaves Ken VK3AKK to GJ4ICD and Moss VK7IK to PA0LSB as the claimants.

After receiving notification from Geoff GJ4ICD that the VK3OT contact was less than 17000 km, I spent some time reviewing the matter and came up with a few interesting observations.

Chris G4IFX supplied me with the latitude and longitude of Martyn G3UKV, which then gave me his grid square to six places. I used the Latitude and Longitude co-ordinates for both parties rather than the grid squares, thus achieving greater accuracy.

Also, I ran some checks from between the UK and south-eastern Australia and came up with the following answers:

1. From Hamilton there is nowhere in England, Scotland or Wales which is 17000 km or more. From Melbourne most of the western side of those areas are a little more than 17000 km, also Jersey Island at 17144 km.

2. From Hamilton, the east coast of Ireland in 1064, 1063 and 1062 are all more than 17000 km, as are IN78 on the tip of France, IN58 and other places on the western coast of Portugal, IN53 in Spain and IM78 in Gibraltar. The angle of the path to G3UKV is 313 degrees which crosses the equator at about 45 degrees; the others range from 324 degrees at the north-western tip of Scotland, 316 degrees to Northern Island down to 282 degrees at Gibraltar. That gives you some idea of the spread of the area involved.

3. So unless you live on the eastern side of Melbourne or other points further east, or Tasmania, then you will not make 17000 km to the UK or Europe.

I also mentioned the contact on 27/11/91 between Mike VK2FLR and Joel CU/N6AMG in the Azores at 19424.1 km.

Neville VK2QF and David VK2BA also made contact with CU/N6AMG on that day. As far as I can ascertain no other amateurs from south-eastern Australia made it to the Azores.

Overseas

Geoff GJ4ICD: from *HRT News* and *Internet Six News* supplies the following:

"After a successful two day visit to Egypt by Chris G3WOS and Nick G3KOK, Ezat SU1ER is now active on six metres from Cairo, using a 100 watt amplifier and PSU donated by the UKSMG, and a three element Yagi.

"On 9/5 Ezat SU1ER worked an IT9 for his first station on 50 MHz. As of 22/5 Ezart had worked IT9, I, 9H1, SV, YU, EH5, 4X, SM, OZ, S5, F, G, SP/YT, LZ, 9A3, 10, DL, YO, ON and Geoff GJ4ICD, the latter at 1644 on 22/5 at 5x9 – a good signal for double-hop. [Shows what can be achieved if you live in a place within range of scores of countries. When F2 returns, Egypt will be within useful range of Australia. Note it down. . . de VK5LP]

"A large aurora occurred in Europe on 15 May. John G4SWX reported SM and GM strong on 144 MHz, A1 1446 LY2WR on 432 reported hearing SM3AKW 59A." [That's interesting. It had always been my prior opinion that aurora on 432 was questionable, like Es. . . de VK5LP]

"17/5: 9M into JA: Tex 9M270 (ex JA0DMV) in Penang Island (OJ05) was worked by Eric 76CCU and other JR6s in PL36 by Es on 50.110 CW/SSB at 0849-0913 for the first time. Tex is operational with 150 W and four element beam ... de JA1VOK. [VK amateurs – write this one down.]

"20/5: V73 TO JA: First JA opening since returning to V73 land in March. Copied the following beacons: 0715-0742 JA7ZMA 50.027.0, 0757-0840 JA2IGY 50.010.0, 0801-0810 JA6YBR 50.017.3, 0816-0822 JA1?? 50.023.8. Only heard JA1RJU on 50.110 but was unable to work. . . Tim V73AT. [VKs note this one too.]"

Closure

Again, quite a lot of information but more of a general nature. Perhaps there will be some winter Es to report next month.

Closing with two thoughts for the month.

1. Fame is a vapour, popularity an accident, riches take wings. Only one thing endures – character, and

2. The clothes you don't like are the most durable you ever bought.

73 from *The Voice by the Lake*

*PO Box 169 Menangle SA 5264
Fax (085) 751 043

Packet VK5LP@VK5WI#ADL#SA AUS OC
E-mail vk5lp@mcmail.com.au

Adelaide-Amman

292

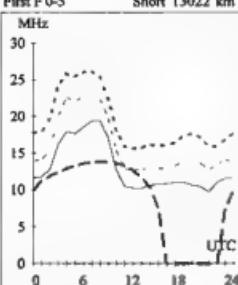
Brisbane-Auckland

123

First F 0-5

Short 13022 km

Second 2F19-23 2E6 Short 2289 km

**Adelaide-Invercargill**

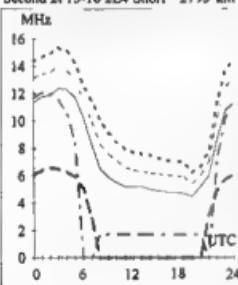
126

Brisbane-Dakar

217

Second 2F15-18 2E4 Short 2795 km

First F 0-5 Short 18280 km

**Adelaide-New York**

67

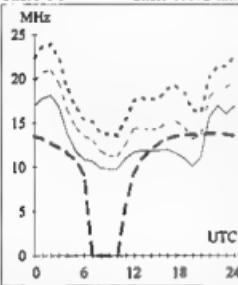
Brisbane-Honolulu

49

First F 0-5

Short 17092 km

Second 3F5-9 3E0 Short 7569 km

**Adelaide-Rome**

296

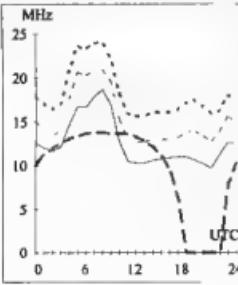
Brisbane-Singapore

293

First F 0-5

Short 15337 km

Second 3F8-12 3E0 Short 6147 km



HF Predictions

Evan Jarman VK3ANI

T Index: 21

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits. This also indicates a possibility of communication (percentage).

The frequencies, identified in the legend, are -

Upper Decile (F-layer, 10%)

F-layer Maximum Usable Frequency (50%)

E-layer Maximum Usable Frequency

Optimum Working Frequency (F-layer, 90%)

Absorption Limiting Frequency

The predictions were made with the Ionospheric Prediction Service program, ASAPS V3.2. The T index used is shown above the legend. The Australian terminal azimuth, path and propagation mode are also given for each circuit.

Canberra-Lusaka

239

Darwin-London

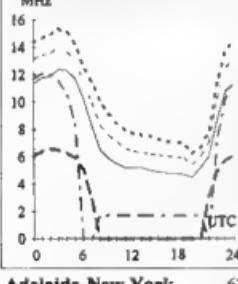
145

Second 4F2-3 4E0

Short 11620 km

First F 0-5

Long 26170 km

**Canberra-Moscow**

317

Darwin-London

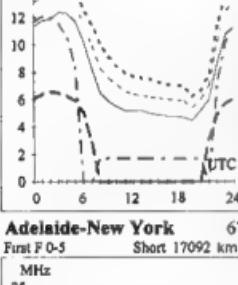
325

First F 0-5

Short 14481 km

First F 0-5

Short 13854 km

**Canberra-Tokyo**

352

Darwin-Pretoria

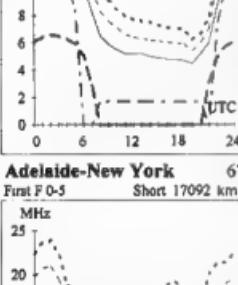
242

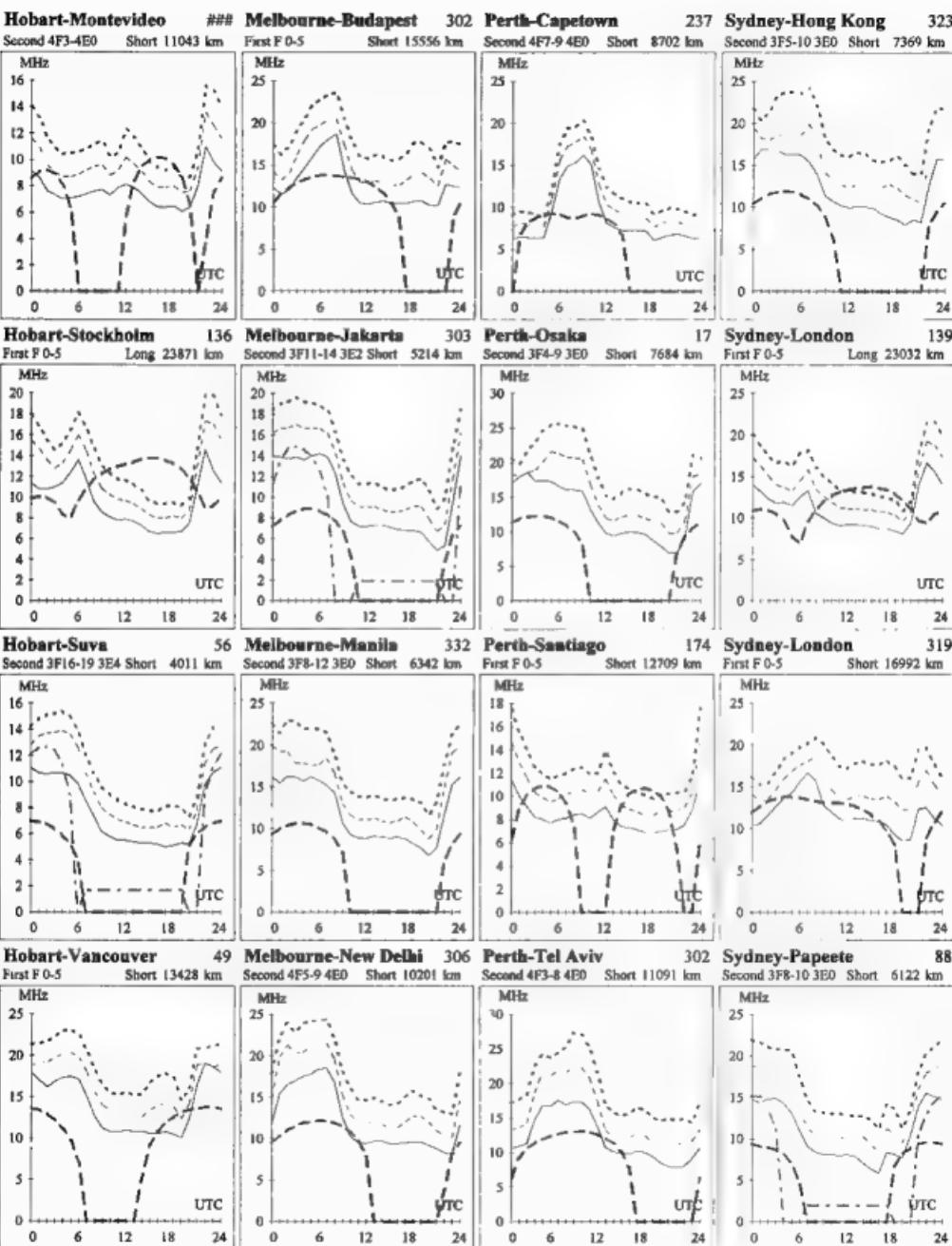
Second 3F4-8 3E0

Short 7948 km

Second 4F4-5 4E0

Short 10639 km





HAMADS

- Hamads may be submitted on the form on the reverse side of the *Amateur Radio* address flysheet. Please use your latest flysheet where possible.
- Please submit separate forms for For Sale and Wanted items, and be sure to include your name, address and telephone number (including STD code) if you do not use the form on the back of the *Amateur Radio* address flysheet.
- Eight lines (forty words) per issue free to all WIA members, ninth and tenth lines for name and address. Commercial rates apply for non-members.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment offered for sale should be included in the Hamad.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
- Commercial advertising (Trade Hamads) are pre-payable at \$25.00 for four lines (twenty words), plus \$2.25 per line (or part thereof), with a minimum charge of \$25.00. Cheques are to be made out to: WIA Hamads.
- Copy should be typed or in block letters, and be received by the deadlines shown on page 1 of each issue of *Amateur Radio*, at:

Postal: 3 Tamar Court, Mentone VIC 3194
Fax: (03) 9584 8928
E-mail: vk3br@c031.aone.net.au

VK2ZHM, QTHR, 02 9417 5338

FOR SALE VIC

- Admiralty Wavemeter G93 (1945), covers 920 to 1080 MHz AM Testset Type II RAAF target oscillator, 17.5 to 160 MHz RAF Wavemeter W1117, 125 kHz to 20 MHz, charts etc, working. USAF altimeter RT-7/APN-1, 400 MHz. Miscellaneous parts. \$160 ONO. SAE for details of more rcvrs, kmtris, test units Ken VK3JII, QTHR, 03 9580 5347
- Emtronics EPS205 switch mode power supply, 13.8 V 20 amp peak, as new (unused) in carton, s/n 00209, \$175 Andy VK3UJ, QTHR, 03 9726 8879
- Kenwood TL-922, \$2500. Kenwood TS-940S, \$2200. Icom 726 and PS-55, \$1200 Drake LAB plus PSU, \$1500 Gem quad, 4+6 band, remote switching, \$1000 MFJ 989C tuner, \$500. Emotator 1103MXX rotator, \$400 Digital weather station, \$400 Daryl VK3DKC, QTHR.
- Kenwood TS-520S, VGC, \$375. Yaesu FT-101ZD, EC, \$450. Icom service manuals for IC-745/751/720A/02A, \$10 each Kenwood TS-120V, EC, \$325 Two of 2 m Slim Jim antennas, free to good home. Ron VK3OM, QTHR, 03 5944 3019.
- New Penta 6146B tubes, \$67.50 per pair. HP Schottky diodes, 5082-2800 series, matched pairs, \$2.80 per pair. John VK3AJL, QTHR, 03 9481 6771.

FOR SALE QLD

- Kenwood TS-530S, GC, new finals, mic and operator's handbook, s/n 1112027, \$600 Yaesu FT-208R handheld w/bchrg, speaker/mic, pan adaptor and operator's handbook, s/n IK052889, \$180. Don VK4DS, QTHR, 07 3379 6341

FOR SALE SA

- Yaesu clearance FT-1012 HF tx/cvr, s/n 21030938 FC-102 1.2 kW ATU, s/n 21010284 FT-707 HF base/mobile tx/cvr, s/n 0K101217. FY-107 ext VFO, s/n 3P040334 YD-148 desk mic Phone me for details and a good deal! Can deliver to you - no problem. David VK5AXW, 08 8370 1066 BH, 08 8370 9569 AH
- Log periodic, 8 el., \$450 CRO, probes, RF adaptors, mobile antennas, much more. Send SASE for list. Paul VK5MAP, PO Box 76, Peterborough SA 5422. Phone/fax 08 8651 2398
- Kenwood SSB filter YK-88SN, new, still in box, with installation instructions. \$75 ONO Hank VK5NCA, 08 8272 7435.

FOR SALE WA

- Kenwood TS-711A 2 m all mode. Kenwood TS-811A 70 cm all mode. Both 25 W, excellent condn, \$900 each Yaesu FT-650 6 m all mode, excellent condn, \$1100 Darrell VK6KDC, QTHR.
- Kenwood TS-130S HFSSB/CW tx/cvr, 80-10 m including WARC bands, good condn, complete

TRADE ADS

AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/prices to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanya Ave Kiama). Agencies at: Webb Electronics, Albany Assoc TV Service, Hobart; Truscotts Electronic World, Melbourne and Mildura; Alpha Tango Products, Perth; Haven Electronics, Nowra; and WIA Equipment Supplies, Adelaide.

• **WEATHER FAX** programs for IBM XT/ATs *** "RADFAXZ" \$35.00, is a high resolution short-wave weather fax. Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" \$45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver *** "MAXISAT" \$75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add \$3.00 postage. ONLY from M Delahuntly, 42 Vilhers St, New Farm QLD 4005 Ph 07 358 2785

• **HAM LOG v.3.1** - Acclaimed internationally as the best IBM logging program. Review samples. AR "Recommend it to anyone": The Canadian Amateur "Beyond this reviewer's ability to do justice. I cannot find anything to

improve on. A breakthrough of computer technology". ARA: "Brilliant" Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just \$59 (+ \$5 P & P), with a 90 page manual. Special 5 hour Internet offer Demos, brochures available. Robin Gandevis VK2VN, 02 369 2008 BH, fax 02 369 3069, Internet address rh@ozemail.com.au

• **US Army Morse key J-45**, \$17. US Jeep antenna, \$42. Marconi Signal Generator TF-144, \$110. Transceiver RT-662/GRC-106, \$380. D Dauner Electronics, 51 Georges Crescent, Georges Hall, NSW 2198 Phone 02 9724 6982 Fax 02 9725 7850.

FOR SALE NSW

- Yaesu FT-290RH 2 m handheld, new battery, case, YH2 headset with VOX. VGC, s/n 180658, \$250. Bruno VK2BPO, QTHR, 02 9713 1831
- 572B/160FTL tubes, pair, new, made in USA by Centron, suit Yaesu FL2100B/FL2100Z, 1000 W HF amp, \$300 pair Ted VK2EZQ/MM, 019 460 437 and leave message, or write QTHR.
- Yaesu FT-101B HF (tx/cvr with two spare output tubes, spare driver tube, low pass filter, s/n SE321218, \$400 ONO. Yaesu FC-101 ATU, s/n 0J050218, \$200 ONO. Yaesu FT-208R 2 m handheld tx/cvr, no battery pack, s/n 3M340464, \$150 ONO Peter VK2AXJ, 044 540 727 or 044 551 311
- Yaesu FT-780R 70 cm mobile tx/cvr, SSB, CW, FM, s/n 3P070718, as new condn, \$375 John

with mic, manual and 500 Hz CW filter. \$450. Steve VK6VZ, 08 9298 9330.

WANTED NSW

- Antennas: GAP Voyager; 3el 40m Yagi - KLM, HyGain or Cuscraft. Base and chimney for 4-1000 valve. SSB Electronics UEK2000S converter; Collins 51S-1 receiver; Drake PS-7 PSU; Ham-M antenna rotator. Tom VK2OE, 046 416 024 evenings.
- IC type SL610, SL1610 or equivalent, voltage controlled RF/IF 30 MHz amp as used in G3TSO tx/cvr (*RSGB Handbook*, 5th Edition). Pat Brennan VK2ABE, QTHR, 067 681 470 (BH).

WANTED VIC

- "Learning the Morse Code for Amateur Radio Purposes" by Roger Davis VK4AAR, and

its associated booklet. Ian VK3KCM, QTHR, 03 9335 8529 BH, 03 5428 7364 AH.

- Copy of handbook to suit Welz SP-300 SWR/power meter. All costs refunded. Mark VK3ZR, QTHR, 03 5986 5779.
- Dud Yaesu FNB-4 battery pack, housing must be in good condn, reasonable price paid. John VK3AJL, QTHR, 03 9481 6771.
- 2C39 tubes (type 7289. Roger VK3XRS, 03 5152 1163.

WANTED QLD

- EHT transformer for Tektronix CRO Model 545B. C Cogozzi VK4CI, QTHR, 07 3888 5013.
- Tx tetrodes 4-400, 4-1000, QY5-500, etc. RCA receiving tube manual RC28 (1970/71). Tait T373 VHFAM airband tx/cvr, T286 PSU. Collins radio accessories, military avionics and radios

1960s and later. Peter VK4APD, QTHR, 07 3397 3751 AH.

- 1296 converter. John VK4TL, QTHR, 070 968 328.

WANTED SA

- Voltmeter 0-20 volts to fit 65 mm round hole. Must be in good condn and good working order. "Please help. I want it for my power supply." Paul VK5MAP, phone/fax 08 8651 2398.

MISCELLANEOUS

- The WIA QSL Collection (now Federal) requires QSLs. All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose VIC 3765, tel 03 9728 5350.

ar

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:

PA (Peter) ALEXANDER VK2PA
AH (Adrian) CHRISTY VK2ACY
MK (Morton) WILLIAMS VK2DEX
SI (Stan) ZEUNERT VK3SZ
LOC (Len) BAKER VK5OC

Morton Williams VK2DEX

1940 - 1997

"Mort" was one of those people quietly helping others, whilst keeping his private life to himself. As a result, he joined WICEN, and became Deputy State Co-ordinator.

About 15 years ago he was working as a storeman when he decided to make a change and took a redundancy. After a trip around Australia with his father, he was having some difficulty finding work. It was suggested that he try for a job that would allow him to further his interest in his electronics hobby.

The ABC's Engineering Research Laboratory had a vacancy, but Mort had none of the required qualifications. At an interview he so impressed them with his practical knowledge that they hired him into a different position, and never looked back.

Mort was able to solve their mechanical problems and learn more about the subject which had been his hobby. As an adult student he went on to qualify for the Electronic Engineering Diploma. Not only did he pass, but he won a prize for high academic achievement. He became the "source" of information on all things mechanical and many things electronic.

Farewell, Mort, you were one of the "good guys."

Dave Horsfall VK2KFU
WICEN (NSW) Vice-President

Len Baker VK5OC

It is with regret that we announce the passing of Len Baker on Sunday, 25 May 1997, after a short illness. Len had not been active in recent years. However, in the past he had been a great supporter of the Division and had also done many things in the field of Amateur Radio.

For most of his working life Len was a member of the Royal Australian Air Force and stationed at the Edinburgh Base near Salisbury SA for a large part of that time. He worked in the engineering field and operated with a separate call sign from a station set up with permission within the domestic area of the base as well as from his home station at Belair.

One of Len's activities back in the 1950s and 1960s was to make regular contact with personnel located at the various Australian bases in the Antarctic. Len used to receive mail and telephone calls from friends and

relatives of people stationed in the Antarctic; and was thus able to forward items of family news to those remote locations. This was well before Third Party Traffic was allowed; however, it has been said that somehow the authorities might have had reception difficulties had they tried to intercept such transmissions from Len.

One of my first encounters with Len was when I stayed for a weekend at his home soon after I moved to Adelaide from Melbourne. On Sunday morning Len awakened me, saying the Remembrance Day Contest was on and we had to make at least 100 contacts towards the Division's score before lunch time. He made a point of supporting the Division each year in the Contest.

Ian Hunt VK5QX
President VK5/VK8 Division
8 Dexter Drive
Salisbury East SA 5109

ar

**Repeaters - additions,
deletions, alterations.
Have you advised the WIA of
changes needed to the
Repeater List?**

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division Address	Officers		Weekly News Broadcasts	1997 Fees
VK1 ACT Division GPO Box 600 Canberra ACT 2601	President Hugh Blenning Secretary John Wooller Treasurer Les Davey	VK1YYZ VK1ET VK1LD	3.570 MHz LSB, 146.950 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet newsgroup www.vk1.wia.ampr.org and on the VK1 Home Page	(F) \$72.00 (G) (\$S) \$58.00 (X) \$44.00
VK2 NSW Division 109 Wigram St Paramatta NSW (PO Box 1066 Paramatta 2124) Phone 02 9688 2417 Freecall 1800 817 644 Fax 02 9633 1525	President Geoff McGroarty-Clark Secretary Eric Fossey Treasurer Eric Van De Weyer (Office hours Mon-Fri 11.00-14.00)	VK2EO VK2EPY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 14.160, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 18.120, 21.170, 584.750 ATU sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup www.vk2.wia.ampr.org , and on packet radio.	(F) \$66.75 (G) (\$S) \$53.40 (X) \$38.75
VK3 Victorian Division 40G Victoria Boulevard Ashton VIC 3147 Phone 03 9885 9261 Fax 03 9885 9296	President Jim Linton Secretary Barry Wilton Treasurer Rob Halley (Office hours Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Macedon, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW, 70 cm FM(R)s VK3CRO and VK3CGL. Major news are under call VK3WI on Victorian packet BBS.	(F) \$75.00 (G) (\$S) \$61.00 (X) \$47.00
VK4 Queensland Division GPO Box 638 Brisbane QLD 4001 Phone 07 48 4714	President Rodger Bingham Secretary Malcolm McIntosh Treasurer Bill Sebbens e-mail address: wiaq@tmxbris.mhs.qz.au	VK4HD VK4ZMM VK4XZ	VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB and 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VK4NET.	(F) \$74.00 (G) (\$S) \$60.00 (X) \$46.00
VK5 South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone 08 8352 3428 Fax 08 8264 0463	President Ian Hunt Secretary Graham Wiseman Treasurer Joe Burford	VK5QX VK5EU VK5UJ	1827 kHz AM, 3.550 MHz LSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHFAUHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB and 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VK5NET.	(F) \$75.00 (G) (\$S) \$61.00 (X) \$47.00
VK6 West Australian Division PO Box 10 West Perth WA 6872 Phone 09 351 8873	President Wally Howse Secretary Christine Bastin Treasurer Bruce Hedden-Thomases	VK6KZ VK6ZLZ VK6OO	146.700 MHz(F) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.580, 7.075, 14.116, 14.175, 21.155, 21.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.855, 3.583 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) \$82.00 (G) (\$S) \$50.00 (X) \$34.00
VK7 Tasmanian Division PO Box 271 Riverside TAS 7250 Phone 03 6327 2096 Fax 03 6327 1738	President Ron Churcher Secretary Barry Hill Treasurer Mike Jenner	VK7RN VK7BE VK7FB	146.700 MHz (VK7RHM) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.050, 14.175, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) \$74.00 (G) (\$S) \$60.00 (X) \$46.00
VK8 (Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).			Membership Grades Full (F) Pension (G) Needy (G) Student (S) Non receipt of AR (X)	Three-year membership available to (F) (G) (X) grades at fee x 3 times

Note: All times are local. All frequencies MHz.

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